The Open University of Tanzania
Consultancy Bureau (OCB)

ASSESSMENT OF THE PROFITABILITY AND ECONOMIC IMPACT OF SMALLHOLDER EMPOWERMENT (SHE) PROJECTS

FINAL CONSULTANCY REPORT

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LIST OF ABBREVIATIONS

ACMD	Anglican Church Morogoro Diocese
ACT Alliance	Action by Churches Together Alliance
BAKWATA	Baraza Kuu la Waislamu Tanzania (National Muslim Council of Tanzania)
CCT	Christian Council of Tanzania
DAICO	District Agricultural, Irrigation and Cooperative Officer
DALDO	District Agriculture and Livestock Development Officer
DC	District Council
DOC	Day-Old-Chicks
ELCT	Evangelical Lutheran Church in Tanzania
ELCTND	Evangelical Lutheran Church in Tanzania Northern Diocese
FGD	Focus Group Discussion
KIRVIA	Kilosa Inter-religious VICOBA Association
NCA	Norwegian Church Aid
IR VICOBA	Interreligious Village Community Banks
NLIs	Next Level Investments
PETs	Public Expenditure Tracking System
OCB	Open University Consultancy Bureau
RDC	Rural District Council
SHE	Smallholder Empowerment
SUA	Sokoine University of Agriculture
TEC	Tanzania Episcopal Conference
TC	Town Council
TOR	Terms of Reference
TZS	Tanzanian Shillings
VICOBA	Village Community Banks

ASSESSMENT OF THE PROFITABILITY AND ECONOMIC IMPACT OF SMALLHOLDER EMPOWERMENT (SHE) PROJECTS

EXECUTIVE SUMMARY

Norwegian Church Aid (NCA) supports sustainable development and advocacy for pro-poor policies and fair distribution of wealth. NCA Tanzania and partners are aggressive to support the small agricultural producers to increase profits and productivity through various interventions. The 2016-2020 Tanzania country's strategy attests that NCA Tanzania has implemented veggies, fruits and poultry projects to help the poor climb out of poverty. Consequently, Smallholders Empowerment (SHE) projects concentrating on Vegetables (*Veggies),* fruits and poultry production have been designed to empower economically the smallholder farmers. NCA model for smallholder economic empowerment categorizes investments into entry and next levels depending on the amounts of capital used; where the later uses relatively large capital than the former. Vegetables and fruits production using drip irrigation and quality inputs and improved poultry production are introduced innovations for adoption at entry and next level investments. Inter-religious (IR) Village Community Banks (VICOBA) groups have been initiated by NCA to serve as source of capital for the two levels of investments. However, the extent to which large numbers of individuals and different groups have been empowered economically by SHE projects has not been adequately documented.

Thus, consultants were tasked to assess the profitability and economic impact of SHE projects. The specific objectives of the assessment were to: analyze the cost structures for each investment type (veggies, fruits and poultry); establish the payback period for each investment type; assess the rate of return for each investment type; determine evidence-based revenue streams and cash inflow per each investment type; assess the net and gross profit margins and identify and document best practices and key design criteria and delivery model that increase or hinder projects' impacts.

The survey was conducted in Hai, Moshi, Arumeru, Babati, Bagamoyo and Kilosa districts; Morogoro town and Arusha City from 11th to 24th July 2019. During the survey, 31 veggie farmers and 30 poultry keepers who had realized impacts and 23 veggie farmers and 6 poultry keepers who had not realized impacts were interviewed. Moreover, 31 VICOBA members who were project beneficiaries and 32 NCA partners, part time staff, government officials and 29 strawberries, cucumbers and tomato fruits' cluster farmers were interviewed using the Focus Group Discussion and in depth interviewee techniques. The concurrent mixed method design was used in data collection and analysis. Quantitative data were analyzed descriptively using SPSS and excel sheets while the qualitative data were analyzed using content analysis.

The assessment revealed that veggies have different cost structures and except for tomatoes whose costs per bed, in the first round and per year were Tanzanian Shillings (TZS) 98,582, 1,505,350 and 2,933,350 respectively; the costs for other veggies (Chinese, *sukuma wiki, saro* (fig), amaranth, *Loshuu (*Ethiopian mustard), *Mnavu* (African nightshade), spinach and Swiss chard) per bed, in the first round

were TZS 31,996, 31,017, 31,782, 28,813, 29,712, 26,183, 29,775 and 30,800 respectively; pointing that in average a farmer needed TZS 30,000 to operate one bed of veggies per season. The total costs in the first round for average of 3,2,2,2,3,2,3 and 4 beds were TZS 75,635, 57,623, 63,679, 55,975, 86,900, 45,500, 118,150 and 123,200 respectively. The analysis renders that the total costs per season depended on the number of beds and time used to maintain beds.

In terms of fruits, cucumbers required less costs per bed in the first, second, third and fourth production rounds (TZS 36,475, 6,042, 6,042 and 9,475 respectively). The strawberry cost structures were TZS 1,049,988, 529,538 and 529,538 for year one, two and three respectively. Furthermore, costs for tomatoes produced in a clusters, were TZS 109,170 and 40,911 for season one and two respectively. For poultry production, average costs for 100 chicks in the first round were TZS 957,892 while in the second round were 428,392. Total costs were less in the second round because average fixed costs of TZS 529,500 were incurred only once.

Average selling weeks for Chinese, *sukuma wiki, saro,* amaranth, *loshuu, mnavu,* tomatoes, spinach and Swiss chard *were* 12,15,21,10, 14, 4, 10, 12 and 16 respectively. Cucumbers and strawberries were sold in duration of three months while strawberries' farmers earned income in the period of three years consecutively. Broilers and layers poultry keepers accrued income in average period of three and nine months respectively.
The payback period for each investment type was as follows: Veggies; One production round (3 months) except *mnavu*-in the second round (6 months). For fruits; Strawberries-6 months (in a one year round), cucumber fruits-3 months (in the first round), tomatoes in cluster production -3 months (first round) and poultry production; 6-months (in the second round).The findings indicate that tomatoes, Chinese and cucumber farmers earned 12, 11 and 55 times of the initial capital respectively. The rate of return for other veggies and fruits ranged from 6-8 times of the initial capital as follows: *sukuma wiki*-6 times; saro 8-times; amaranth-7 times; *loshuu*-8 times; *mnavu*-2 times; spinach- 5 times; and Swiss chard-7 times. Furthermore, poultry scored the rate of return of 2 times the initial capital.

The findings evidenced that Ms. Rose Timothy, Mr. Dodo Matambo and Ms. Lightness Mushi were the farmers with excellent cash flow streams and higher gross margins. Ms. Rose Timothy from Soweto Street in Moshi town earned TZS 51,000,000 per year from 17 beds of tomatoes. Ms. Lightness Mushi from Roosinde village in Hai district earned TZS 9,936,000, 1,344,000 and 835,200 per year from 18, 4 and 3 beds of Chinese, *loshuu* and amaranth respectively. Mr. Dodo Matambo from Gedamar village in Babati district earned TZS 4,320,000, 3,456,000 and 2,592,000 from 10, 8 and 6 beds of Chinese, fig and *sukuma wiki* respectively. Farmers with one veggie included Ms. Upendo Japhet from Ngombaru village in Siha district who earned TZS 252,000 per year from 3 beds of amaranth. Mr. Lwitesen Swai from Modio village in Hai district earned TZS 1,260,000 per year from 4 beds of Spinach and Ms. Helen Mushi from Modio village in Siha district earned TZS 1,536,000 per year from 4 beds of Swiss chard. For Fruits; Ms. Donna Mnali (an independent farmer) from Arusha City earned a minimum of TZS 6,000,000 per year from 6 beds of Strawberries. Group members from Bwawani fruit clusters in

Bagamoyo district earned TZS 3,109,967 and 1,560,000 per bed per year from cucumbers and Tomatoes respectively. In Poultry production; Ms. Celina Kazimoto from Dumila village in Kilosa district, who kept 500 chickens in her fifth round, earned TZS 4,700,000.

The gross profit margin per bed for the first season for tomatoes were TZS 905,964 while for Chinese, *sukuma wiki, saro*, amaranth, *Loshuu*, *Mnavu*, spinach and Swiss chard were TZS 69,837, 68,164, 109,361, 58,588, 81,717, (6,300), 905,964, 55,483, and 75,600 correspondingly. Mnavu was the least because it was not usually grown independently but it was mixed with other vegetables. The gross margin per year for Chinese, *sukuma wiki, saro* amaranth, *Loshuu*, *Mnavu*, spinach and Swiss chard were TZS 739,169, 471,392, 789,229, 533,800, 746,933, 26,250, 32,472,000, 669,750 and 907,200 respectively. For fruits grown in clusters; the gross margins of strawberries per bed were TZS 1,110,012 and 1,630,462 in year and 2 respectively. However, cucumbers and tomato fruits in clusters registered a gross margin of TZS 785,958 and 739,089 respectively per year. Furthermore, the gross margins of poultry were TZS (57,892), 428,392 and 856,784 for first, second and third rounds respectively. In the first round the gross margin was negative because keepers covered the fixed costs of poultry houses and dishes.

The assessment found that women and youths were empowered economically. Moreover, participation in the project increased confidence and daring spirit among women and it increased the value of women in the households. The assessment further revealed that VICOBA have promoted adequately veggies and fruits production and poultry keeping activities by providing capital. Moreover, 70% of projects' beneficiaries were VICOBA members. The study further revealed that at least 93% of projects' beneficiaries who were VICOBA members managed to repay their loans on time. However, the consultants noted that youths and men were hesitant to join VICOBA compared to women because they lacked enough knowledge on VICOBA.

The assessment further revealed that the projects' best practices and design criteria that increase impacts were: easy availability of inputs and extension services, local demand of veggies, fruits and poultry products, use of effective communication strategy, use of electronic data entry system by NCA staff, para-staff and partners, edibility of vegetables, fruits and poultry products, veggies production and poultry keeping were used as a source of employment for all categories of people (men, youths, elders, women, people with disabilities), use of religious institutions as a strategy, small area of land for running the projects and low costs of the projects (cost efficiency and effectiveness). However, the study revealed that the project was hindered by inadequate water supply for veggies production particularly in Gedamar village in Babati District. Other hindrances include: high price of feeds, inadequate number of agronomists and veterinary staff, price fluctuations for veggies and poultry products, low knowledge on health insurance for farmers and poultry keepers and low knowledge on pesticides and insecticides application for farmers. Ineffective collaboration for partners and government officials and lack/inadequacy of working tools for agripreneurs, agronomists, day old chicks' producers and feeds' processors were also unveiled.

RECOMMENDATIONS

i. NCA should facilitate the availability of water for irrigation for areas with drought such as Gedamar village, Gallapo ward in Babati Rural District. This is because the present water tank of 5,000 litres volume had no capacity to supply the required water to all project's beneficiaries. NCA could facilitate the purchase of the larger water tank of 10,000 or even 20,000 litres to facilitate veggies irrigation during the drought season. The tank might be provided as a loan which would be repaid by veggies farmers through Inter Religious (IR) VICOBA groups.

ii. NCA should facilitate the availability of reliable markets for veggies, fruits and poultry products. This could be facilitated through value addition, contract farming and collective farming in farmers' clusters.

iii. Veggies and fruits farmers should be frequently trained on veggies and fruits production practices, including proper applications of pesticides, insecticides and fungicides. Also the training is essential for poultry keepers.

iv. The project should help the poorest people to climb the ladder of poverty. It could offer them initial loans as capital through IR VICOBA which should be repaid in a period of one year. NCA should encourage more men and youths to join VICOBA to promote the capital access for them.

v. Veggie and fruit farmers should be educated on the importance of health insurance. As the study revealed that majority of veggie farmers and poultry keepers were not covered by health insurance except 20% of them.

vi. Farmers should be encouraged to add value on fruits. They could produce strawberry blended juice or use strawberry in yoghurt. Also they could produce the tomato paste and processed cucumber products. Farmers might imitate Ms Donna Mnali; an independent strawberry farmer from Arusha City who invested TZS 5 million for opening the strawberry juice point in Arusha City where she used some of her strawberry for juice processing. This initiative should be imitated by other strawberry farmers.

vii. As one of the market strategies, many veggies, fruits, and poultry clusters should be established to enhance the continuous products supply in the market throughout the year as demanded by some buyers. For example "and beyond" tourist hotel in Ngorongoro National Park demanded 30 kg of strawberry three times per week but farmers failed to meet such demand. NCA should encourage many farmers to grow strawberries since the consultants found that production capacity did not match with the strawberry markets' demand.

viii. NCA should employ more veterinary staff and agronomists, and recruit the "para-veterinary staff" who could work with NCA veterinarians. Also NCA should increase collaboration with government veterinarians and extension officers so as to serve more poultry keepers and farmers and also to curb the problem of staff inadequacy.

ix. NCA should promote effective collaboration between partners and government officials and provide the missing working tools for agripreneurs, agronomists, local day old chicks' producers and local feeds' processors.

1.0 BACKGROUND, OBJECTIVES AND SCOPE OF THE PROFITABILITY AND ECONOMIC IMPACT OF SMALLHOLDER EMPOWERMENT ASSESSMENT

1.1 Background

NCA has been registered in Tanzania since 2006. The main approach of NCA is to support sustainable development and advocacy for pro-poor policies and fair distribution of wealth. NCA Tanzania and partners are aggressive to support the small agricultural producers to increase profits and productivity through various interventions. However, details on what NCA plans and executes in a particular period is usually documented in the five years strategy. NCA 2016-2020 and 2020-2024 country strategy indicate that implementation of NCA 2016-2020 strategy has empowered smallholders economically through micro and next level investments. However, the extent to which large numbers of individuals and different groups have been empowered is not adequately documented.

NCA Tanzania has been selected and mandated by NCA Head Office to find scalable models of helping the poor climb out of poverty. Under the Economic Empowerment country program in Tanzania, pilot projects were designed and established. Given the fact that many of the poor in Africa and Tanzania are food producers (approximately 80% of the poor are food producers and 70% of food producers are smallholder farmers with very low productivity and incomes), the decision was made to analyze value chains and potentials for intervention in agriculture. Several project ideas appeared to offer the most potential for helping the poor climb out of poverty were piloted and some of them are currently being scaled up in different parts of Tanzania and other NCA country offices such as Malawi, Zambia and Burundi. The piloted value chains projects that are currently being scaled in Tanzania include vegetable *(Veggie),* fruits and poultry production

NCA model for smallholder empowerment is split into Micro-Investments (entry level investments) and Next Level Investments (serving as an upgrade from entry level investments). The difference lies in the start-up capital that a smallholder farmer needs to make or increase an investment in a particular value chain. *Veggie,* vegetable production using drip irrigation and quality inputs, falls under micro-investment concept. Under this arrangement farmers get access to drip irrigation kits at an affordable price. Farmers prepares a typical 8 sqm vegetable bed costs only TZS 15,000. They also pay the irrigation kit's costs to the local entrepreneurs that are called also agripreneurs. These have the role of finding the new micro-investors, sell kits and provide advice on how to make raised vegetable beds and caring for plants. Technical support is provided by the field agronomists and marketing specialists.

Therefore, farmers participating in *Veggie* and fruits production use drip irrigation technologies and quality inputs to promote higher productivity. The next level investment (poultry production particularly chickens) aims at addressing issues in five levels of value chains which are: (1) improving chicken houses, (2) better chicken breeds, (3) improving drug use and vaccination, (4) promoting the use of simple technologies and (5) improving chicken feed. Within this project, artisans are trained on how to make quality and affordable chicken houses and they charge labour fees from the service. Poultry keepers are trained on how to keep chickens as a business. In addition, they are trained on how to make quality chicken feed using locally available resources and technologies while others are involved on producing Day-Old-Chicks (DOC). The project is designed to create specialized businesses within the value chain that complement each other (similar to a Business to Business- B2B2C model). The NCA role of in all these initiatives

is to facilitate or create the motivational environment for investment (e.g. by providing trainings) for the poor and encourage them to investment using their own resources.

There are few success stories showing that poor people living in the project areas have gone extra miles to overcome the problem of poverty. The prosperity status of some projects' clients shows that they have "walked the money journey" of economic development. The good thing is that, the journey starts at low level of making money as well as using the simplified production technologies.

Saving through VICOBA is also a facilitating factor for reaching the poverty free destination since VICOBA act as a source of capital for investment. However, it should be noted that sometimes, VICOBA lack adequate capital, thus some of the micro investors use the capital saving strategy and expand their investments slowly stage by stage. Through use of VICOBA capital and own saved capital, it comes a point where a micro investor accumulates adequate amount of capital and starts to diversify income generating activities. It means that, at this stage he moves from micro to next level investment. The journey is expected to reach a medium level or even large investment by some of them. Poultry production is regarded as semi commercial production which entails the next level investment which aims at alleviating poverty and ensuring food security as well as reducing child mortality in poor households.

The consultants are also aware that the NCA 2020-2024 regards gender analysis as one components of the contextual analysis. Therefore, in our analysis we have also assessed the influence of the project specifically to women. Moreover, we have assessed how the project has assisted other vulnerable groups in the community (youths, most poor and people with disabilities).

1.2 Rationale

The major focus of this consultancy is profitability and economic empowerment of the project beneficiaries who were involved with fruits and vegetable production and poultry keeping. NCA has contracted OCB to assess the profitability and economic impact of smallholder empowerment (SHE) projects for the following reasons:

i. Deepen NCA understanding of the profitability and economic impact to those undertaking SHE activities in the context of economic empowerment.
ii. Contribute to a comprehensive and deepened discussion and reflection about economic empowerment in the 2020 – 2024 country strategy.
iii. Providing justification of the project and its associated costs to stakeholders including rights holders and partners.
iv. Improve NCA communication to beneficiaries, partners, donors and other stakeholders when advocating for investments in such projects.
v. Propose best delivery model, considering project delivery cost and approach.
vi. Improve NCA documentation of results and impact to targeted rights holders in Tanzania and other NCA countries;

1.3 Scope

The consultants assessed the profitability and economic impact of SHE projects (veggie, poultry and fruits) to individuals, families and general community while considering each participant in

the value chain operating as a business as reflected in the 2020 – 2024 country strategy with the following priorities: interfaith actions to strengthen civil society, addressing gender based violence, climate smart economic empowerment, fighting inequality and supporting sustainable faith-based health care through Hydom Lutheran Hospital. However, the economic empowerment assessment has a base from the 2016-2020 country strategy which stresses that: "NCA's economic empowerment programme will empower rights holders economically and socially through securing entrepreneurial opportunities and sustainable development" (page 19). Based on the TOR provided, our assignment focused on economic empowerment assessment of smallholder in Kilosa, Hai, Moshi rural and Babati rural districts. However, ample time will be spent in Dar es Salaam NCA headquarters for reviewing the documents, consulting the NCA staff and writing reports.

1.4 Objectives of the assessment

1.4.1 Main and Specific Objectives

The main purposes of the consultancy are to:

i. determine the profitability of micro and next level investments at all value chain levels, and

ii. demonstrate the extent to which these investments bring about the economic change to individuals, their families and the general community in the selected project areas.

1.4.2 Specific objectives

Specific objectives of the assessment are:

i. To analyze the cost structure for each investment type (veggie, fruits and poultry).
ii. To establish the payback period for each investment type.
iii. To assess the rate of return for each investment type.
iv. To determine evidence-based revenue streams and cash inflow per each investment type.
v. To assess the net and gross profit margins.
vi. Identify and document best practices, key design criteria and delivery model that increase or hinder project impact.

2.0 METHODOLOGY OF THE PROFITABILITY AND ECONOMIC IMPACT OF SMALLHOLDER EMPOWERMENT ASSESSMENT

2.1 Assessment Approach and Steps

The consultants undertook participatory consultation with all relevant identified stakeholders. The activity was undertaken in the following sequence

(a) Review of NCA documents at NCA headquarter Mikocheni, Dar es salaam and review of the related literatures
(b) Development of Survey Tools; questionnaires and checklists
(c) Preparation and submission of the inception report to the designated contact official within NCA
(d) Logistic arrangement for the field visit
(e) Visiting field and collecting information from vegetable and fruits farmers, poultry keepers, agri-preneurs, agronomists, market specialists, poultry house artisans, feed processors, Day Old Chick producers and suppliers (Silverlands), VICOBA leaders/staff, NCA partners and government stakeholders (Extension officers, village leaders and dispensaries/health centre representatives)
(f) Data audit, entry, analysis, presentation and acceptance
(g) Draft report writing
(h) Joint draft report discussion and feedback
(i) Incorporation comments into final report
(j) Submission of the final evaluation report to NCA

2.2 Field Data Collection

The Consultants requested NCA to make prior data collection arrangements with selected respondents, including securing the venues for group discussions, field transport and other logistics. The consultants collected both qualitative (gathering in depth information from interviews and focus groups) and quantitative (numerical information). The in-depth interview was conducted to key informants i.e. NCA working partners, drip irrigation kits manufactures, agronomists, market specialist, artisans who make the quality and affordable chicken houses, feeds processors, day old chick suppliers (Silverlands), VICOBA representatives and government stakeholders (extension officers, village leaders and dispensaries/health centre representatives). The semi-structured questionnaires were administered to individual vegetables and fruits farmers and poultry keepers where information related to production and marketing were collected through the focus group discussion. The list of the veggie and fruit farmers, poultry keepers and other stakeholders involved in the survey are indicated in Table 2.2 and 2.3.

The field work was conducted in Morogoro, Coast, Kilimanjaro, Arusha and Manyara regions, specifically in Kilosa, Bagamoyo, Hai, Moshi, Arumeru and Babati rural districts and in Arusha City and Morogoro town from 11th to 24th July 2019. The field zones were categorized based on veggie/fruits production and poultry keeping. NCA Programme officer communicated with partners who identified the respondents to be interviewed in each district (Table 2.2 and 2.3). The prerequisites for the veggie farmers and poultry keepers to be included in the sample were given prior by the consultants. For impacts assessment the consultants preferred the veggie farmers and poultry keepers who have already sold the products at least once. The consultants

used voice recording devises to assist capturing the qualitative information. The social science data collection techniques were applied where triangulation method was used and sensitive questions were asked using follow-up questions. The consultancy abode to the research ethics as required. They collected only the intended information for the consultancy assignment and considered the consent of the respondents before interrogating them. Moreover, to enhance confidentiality, the team signed the confidentiality agreement with NCA designated staff to certify that they will not disclose NCA information to any organization or competitor.

2.3 Data screening, coding and analysis

At the end of each day, each questionnaire/checklist was checked if data were entered correctly. If there were missing data, the consultants requested respondents to clarify or correct data using mobile phones. Then information were coded and entered into excel sheets and SPSS software. Afterward, data were analyzed to allow analysis of cost structures for each investment type (veggies, fruits and poultry). Moreover, calculation of payback period, the rate of return, revenue, cash inflow, net and gross profit margins for each investment was analyzed using excel sheet while impacts variables which are descriptive in nature were analyzed using SPSSS software.

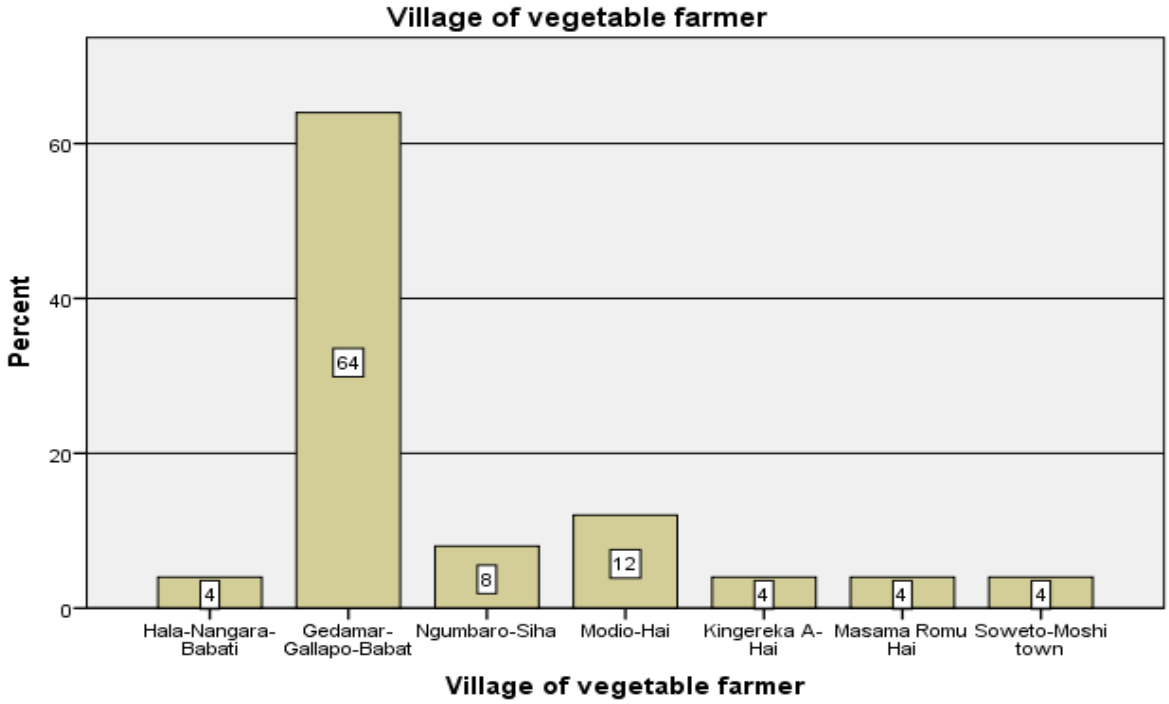
2.4 Limitations and challenges during data collection

During data collection there was a mourning of Rev. Aminirabi Swai who was the head of Lutheran Church Hai diocese. He died on 11th July 2019 which was the first day of data collection. This affected much data collection exercise in Kilimanjaro region-both in Moshi and Hai district, because the veggie farmers and poultry keepers in the two districts attended his mourning and funeral. However, the consultants strived to work many hours and managed to reach 31 active individual veggie farmers and 30 poultry keepers who had already realized the impacts in Kilimanjaro, Manyara and Morogoro regions (see Table 2.2 and 2.3). Walonick (2010) confirmed that the sample size of 30 respondents is convenient for making the statistical analysis.

2.5 Number of Respondents who participated in the exercise

The number of respondents who participated in the in depth interview and focus group discussion is indicated in Table 2.2 and 2.3. Creswell (1998) recommended a sample size of 5-25 respondents for a focus group discussion in phenomenological studies. However, the number of respondents in the focus group may vary by considering the information saturation problem (a point where the participants of the group discussion give the same information). Table 2.3 shows that the number of sample size in the group discussion ranged from 1-18 depending on the nature of the activity and respondent's availability. For instance, Mr. Nassoro Kibunda was the only male poultry keeper found in Mijogweni village and the male respondents for Weruweru and Edeni plants strawberry cluster groups were 1 and 4 respectively. Figure 2.1 indicates the proportion of vegetables farmers who were interviewed.

Figure 2.1: Area of survey for vegetable farmers



2.6 Poultry keepers interviewed

For the case of the poultry keeper, Table 2.2 shows that majority of poultry keepers were from Dumila and Magole villages in Kilosa district because the poultry keepers assembled at one point (Dumila Kilosa), contrast with Moshi district where the consultants visited poultry keepers in their localities. Since the poultry keepers were more scattered, much time was used in travelling. However, in Kilosa district the consultants interviewed three poultry keepers at Zombo village when they were on transit to Kilosa district to interview the district agriculture, irrigation and cooperative officer (DAICO).

Table 2.1: Poultry keepers' survey locations

Village of survey	Frequency	Percent
Dumila-Kilosa	8	26.7
Magole-Kilosa	6	20.0
Zombo-Kilosa	3	10.0
Mijogweni-Hai	3	10.0
Kiyungi-Hai	1	3.3
Mvuleni-Moshi rural	1	3.3
Mawanda-Moshi rural	1	3.3
Kingereka A-Hai	1	3.3
Mrimbo-Mwika-Moshi rural	1	3.3
Mandela	5	16.7
Total	30	100.0

Table 2.2: Number of respondents interviewed (all categories)

Category of interview	Total	Males	Females
Veggie farmers who engage in production	31	13	18
New veggies farmers	23	10	13
Poultry keepers who engage in production	30	11	9
New poultry keepers	6	4	0
Village government officers	4	3	1
Village and ward extension officers	4	2	2
District Level officers-DAICO, DALDO, Youths officers	5	4	1
NCA Partner staff	3	3	0
Agronomists	4	3	1
Veterinarians officer	1	1	0
Marketing officers	1	1	0
Dispensary representatives	1	0	1
Agripreneurs	3	2	1
Day Old Chicks hatchers	1	1	0
Chicken feeds processors	3	1	2
Artisans	2	2	0
Total	**122**	**61**	**49**

The focus groups members were interviewed for each activity by classifying them into male and female groups for each variable of study such as poultry keepers, veggie farmers, and fruit cluster farmers as indicated in Table 2.3.

Table 2.3: Focus Group Discussions' (FGDs) Participants

Location of survey	**Target activity**	**Men**	**Women**	**Total**
Kiyungi-Hai	Poultry	1	5	6
Weruweru-Hai	Strawberry Cluster	4	5	9
Hala-Babati	Veggie	18	14	32
Dumila-Kilosa	Poultry	17	16	33
Arumeru-Eden Plants	Strawberry Cluster	1	7	8
Njiro-Women	Strawberry	0	1	1
Bwawani	Tomatoes and cucumber	4	7	11
Total		**45**	**55**	**100**

3.0 FINDINGS AND DISCUSSION

3.1 Introduction

This chapter presents and discusses the findings of the study. The analysis has been classified into veggie and fruits production and poultry keeping. The analysis begins with how the important demographic variables link with impacts variables and NCA strategic objectives.

3.2 Demographic information for Veggie farmers

3.2.1 Sex of veggie farmers

Findings from Table 3.1 indicate that women veggie farmers were more than men. The consultants targeted more women because they aligned with NCA strategic objective which aimed at empowering the disadvantaged groups, including women. The consultants reveal that both women and men benefited from NCA project. The study further found that the nature of irrigation technology was simple and it could be easily adopted by both men and women and it was not a gender biased. However, the study found that some men discouraged their women to join the project. For instance Ms Catherine Bisule (39 years) from Gedamar village asserted that:

"It is challenging, that other men are stubborn and discourages their wives from joining the project. You will find him telling you, will you be really, able to take care of this project? You are lazy! You are now accepting the project that is expensive costing TZS 15,000, which I believe that you will not manage to handle it. This real discourages some of our fellow women to join the project". Based on these findings, the consultants recommend that men should be educated on the rights and responsibilities of women in the society.

Table 3.1: Sex of Veggie farmers

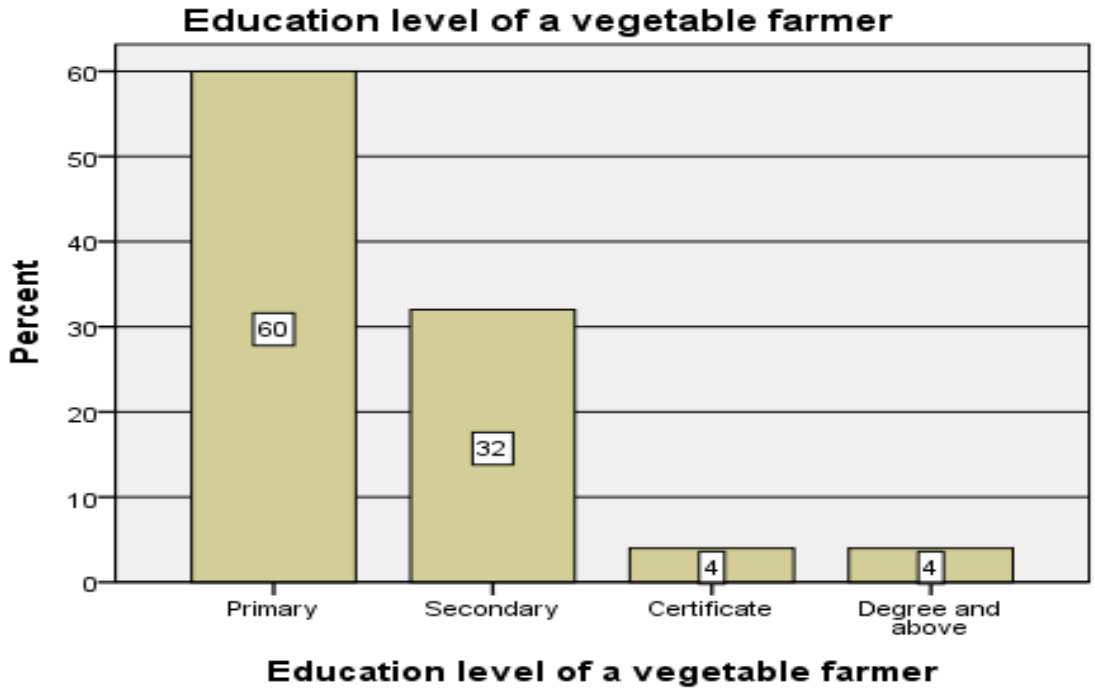
Sex	Frequency	Percent
Male	13	42
Female	18	58
Total	25	100

3.2.2 Education level of Veggie farmers

Figure 3.1 shows that the education level of the veggie farmers ranged from primary education to the bachelor level. The data indicates that 60% of farmers comprises of primary education. Hence, they can be trained into various vegetable production and marketing techniques. Therefore, NCA should set strategies to train them. It was noted during the survey that almost 98% of the farmers adhered to good agronomic practices as they were taught by the agronomists. It happens at Bomang'ombe Hai district that three women wanted to buy veggie from Mr. Mustapha Ng'unda aged 67 and he resisted to sell to them vegetables, arguing that he can't do so because he sprayed the pesticides six days ago and hence the veggie are not suitable for human consumption based on the agronomist's recommendations. Also the consultants noted that irrigation drips were well installed and planting spacing, fertilizers applications and irrigation of vegetables were properly practiced as taught by the agronomists. However, it was noted that some farmers did not follow the agronomists' recommendations. For instance Ms. Rose Timothy at Soweto in Moshi town sprayed various pesticides on her tomatoes without following the agronomist's advice. As a result she incurred a lot of costs to purchase the pesticides and at the same time the problems persisted because of incorrect application of pesticides.

The study further noted that veggie farmers lacked marketing skills because they concentrated much on production without knowing where they could sustainably sell their veggies. Therefore, the study recommends that more training on production and marketing should be conducted to veggie farmers. Also Mr. Cathbert, an agronomist for Moshi district argued that there was an eruption of new veggies' diseases and pests day after day. This implies that there should be also frequent training for the agronomists on how to deal with new pests and diseases.

Figure 3.1: Education Level of a veggie farmers



3.2.3 Marital status of veggie farmers

Table 3.2 indicates that 84% of veggie farmers were married. The finding implies that veggie production is important for provision of nutritious vegetables to the families. During the survey, farmers acknowledged that veggie production enhanced the availability of veggie for home consumption; despite this will be elaborated more in the impacts section. Also veggie production facilitated purchase of family needs by using the income obtained from selling veggie. The results indicate that veggie production has helped both individuals and married farmers to meet their needs. Married couples are important for supplying additional labour for veggies production and management.

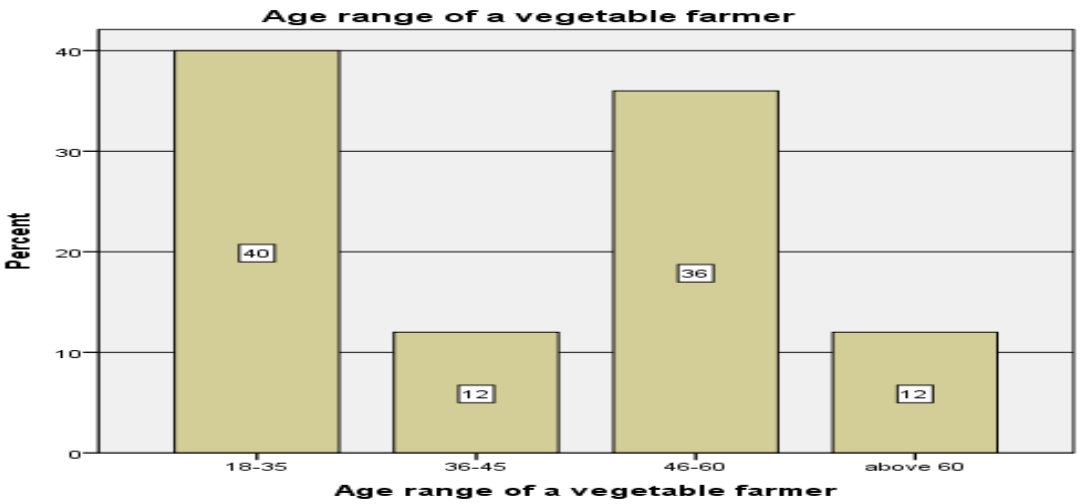
Table 3.2: Marital status of veggie farmers

Sex	Frequency	Percent
Single	4	16.0
Married	21	84.0
Total	25	100.0

3.2.4 Age ranges

The information about the age ranges of veggie farmers are presented in Figure 3.2. The data shows that youths are 40% of all respondents. Why this case? Because veggie production is a short duration income earning project, requiring less capital and less piece of land; hence it has attracted many youths to engage in veggie production. About 50% of youths who completed ordinary secondary school education (for example Mr. Bura John 20 years, Ms. Aisha Ramadhani 20 years, Ms. Maimuna Juma 21 years and Ms. Mwanaidi Nada 24 years) decided to engage on vegetable production as their job employment options. Therefore, veggie production acted as for self- employment option for youths. One youth Mr. Emmanuel Yarro (30 years) who graduated in Bachelor of Science in mathematics and statistics from Mwenge university-Moshi engaged in veggie production in Gedamar village, at Gallapo ward in Babati district. The survey noted that youths with diverse education levels opted to grow vegetables. The findings also show that all age ranges benefited from vegetable production where the maximum age of a farmer was 70 years (Ms. Rahel Urassa from Ngombaru village in Siha district and Ms. Monica Mashayo from Shanti town-Moshi town) and the minimum age was 20 (Ms. Aisha Ramadhani) from Gedamar village in Babati district. Ms. Asha Tsii with 76 years who had two beds of *saro* veggie was not included in the analysis because during the survey she asserted that she would begin harvesting vegetables after one week. The survey noted that both males and females equally participated in veggie production.

Figure 3.2: Age ranges of veggie farmer



3.3 Religious institutions and veggie production

The study reveals that veggie farming is done not only by individual but also the religious groups. For example the Roman Catholic cathedral church in Moshi town grew in 14 beds spinach, Chinese, amaranth, cowpea and onions. The garden's attendant Ms. Gabriella Swai reported that the church had bought irrigation water tank with a capacity of 5,000 litres. The production of veggies was mainly for church's consumption despite they sold and earned up to TZS 30,000 per month and this money was used to pay the water bills. Also production of vegetables enabled them to serve TZS 10,000 which was used previously to buy vegetables per week. Now they could use only TZS 2,000 per week to buy vegetables which they didn't produce. Also at Hai district, the women church's group established one bed of vegetables and

they sold vegetables through auctioning and they earned up to TZS 125,000 per month. They anticipated earning at least TZS 200,000 for the period of two months while they incurred TZS 5000, 15,000 and 6,000 to buy seedlings, irrigation drip and water charges respectively.

3.4 Number of initial and subsequent beds

The information on the number of initial and subsequent beds is indicated in Table 3.3 which shows that 73% of veggies farmers started with one bed while the rest started with 2, 4, 5 and 7 beds. There are many factors which determine the number of beds to start with farmers. Firstly, the amount of capital because majority of farmers were poor opted to start with one bed. Secondly, farmers assessed the veggie production and marketing performance. Thirdly, the amount of available land determined the number of initial and subsequent beds. The findings from Table 3.3 indicate that Ms. Timoth and Ms. Mwasiti Juma did not change the number of beds since they started because of land plot limitations. The data further indicates that many farmers have increased the number of beds because of the benefits they accrued from the veggies production in terms of income earning and veggies consumption. The findings also show that the maximum numbers of beds were owned by Ms. Lightness Mushi from Roosinde Village in Hai district (with 32 beds).

Other farmers with many numbers of beds and who grew veggie in large quantities were Mr. Lwitesen Swai, Ms. Kanaeli Mushi and Mr. Dodo Matambo. The study revealed that 98% of veggie farmers reinvested their income by increasing the number of beds. For example, Mr. Dodo Matambo started with three beds and he expanded to 22 beds. He also bought the water irrigation tank of 5,000 litres. He also grew pawpaw, banana, maize and cowpeas. Mr. Dodo Matambo was considered as a model veggie farmer because of his innovativeness, creativity and easy adoption characters he possessed. The increase on the number of beds by farmers implies that farmers have recognized the importance of veggie production and hence were motivated to expand area under production. The data may also imply that NCA should enhance the availability of reliable market for veggie farmers.

Table 3.3 Initial and subsequent beds up to July 2019

S/No	Name of the farmer	Initial beds	Subsequent beds	Village	District	When started (months)
1	Lwitesen Swai	1	32	Modio	Hai	24
2	Kanaeli Mushi	1	22	Mkombozi	Hai	24
3	Lightness Mushi	1	18	Modio	Hai	12
4	Estomihi Mushi	1	5	Modio	Hai	3
5	Naomi Sawe	1	8	Roosinde	Hai	24
6	Rahel Urassa	1	3	Ngombaru	Siha	3
7	Tarsila Lyimo	1	3	Ngombaru	Siha	2
8	Mr. Nkya	5	18	Bomang'ombe	Hai	12
9	Helen Mushi	4	4	Modio	Hai	24
10	Jamila Maganga	1	2	Ngumbaru	Hai	5
11	Rose Timoth	7	7	Shanti-town-Moshi	Moshi	15
12	Dodo Matambo	2	22	Gedamar-Gallapo	Babati	36
13	Wiras Amma	1	5	Gedamar –Gallapo	Babati	36
12	Bura John	1	2	Gedamar-Gallapo	Babati	3
14	Mwasiti Juma	1	1	Gedamar-Gallapo	Babati	14
15	Ramadhani Ibrahim	1	3	Gedamar –Gallapo	Babati	36

3.5 Costs analysis for veggie

The findings from Table 3.4 show that farmers who grew Chinese, spinach and fig had average of three beds. There were two production practices which were used by farmers. The first practice was to mix two or more veggie in one bed and the other was to grow each veggie separately. The consultants revealed that the later practice dominated the former. The study noted that there was a proportionate increase of production costs depending on the number of beds. Also the costs varied from one farmer to another depending on season of veggie production because in rainy season, the veggie demanded more pesticides and insecticides than in dry season. Moreover, the data shows that tomatoes had high total costs compared with other vegetables because it required high level of insecticides and pesticides spray and high level of fertilizers application and other requirements such as staking pools. Indeed, it was a both capital and labour intensive veggie. The results further indicate that there was a slight variation of the veggie production costs among other veggies where the costs ranged from TZS 26,183 for the African night shade (*mnavu*) to TZS 31,996 for the Chinese per bed in the first round.

The findings from Table 3.4 indicate that the costs per bed for Mnavu were the least followed by amaranth (TZS 28,813). The production costs were higher for Chinese and lower African night shades because they required more and less production inputs respectively. The study reveals 81% of all farmers grew Chinese. Farmers asserted that Chinese was tasty and it had high productivity.

Table 3.4: Average Costs for various vegetables (TZS)

Type of vegetables	Number of beds	Costs of irrigation kits per bed	Total costs all beds first round	Cost per bed first round	Total Costs other rounds	Total costs per year
Chinese	3	19,946	75,635	31,996	44,196	119,831
Sukuma wiki	2	20,000	57,623	31,017	32,692	86,623
Saro	2	20,000	63,679	31,782	33,950	97,629
Amaranth (mchicha)	2	20,300	55,975	28,813	47,025	103,000
Loshuu- *Ethiopian mustard*	3	20,400	86,900	29,712	39,667	126,567
Mnavu- African nightshade	2	20,000	45,500	26,183	19,000	64,500
Tomatoes	14	20,000	1,505,350	98,582	1,428,000	2,933,350
Spinach	3	20,000	118,150	29,775	76,300	194,450
Swiss chard	4	20,000	123,200	30,800	86,400	209,600

3.6 Time to recover the irrigation drip costs

The analysis of revenue in Table 3.5 shows that veggie farmers have ability to recover the irrigation kits costs in the first round at least for all veggies except *mnavu* where it was recovered in the second round. Farmers stated that if the kits were well maintained, they could use them for two and half years before disposal. The findings indicate that the NCA system of subsidizing irrigation kits to farmers should continue because farmers were able to repay the money for

irrigation kits in the first or second production round. The consultants recommend NCA to enable VICOBA loans to purchase irrigation kits for the poorest farmers. The cost of irrigation kit ranged from TZS 17,500 to 20,000 where 15,000 was the cost for the kit and the remaining amount was used to purchase the plastic container which was priced between TZS 2,500-5,000. The consultants found that Mr. Yussuph (Agromist for Sanya Juu district) paid the costs of irrigation drip kits for Ms. Rachel Urassa, a poor farmer with disability aged 70, from Ngombaru village because she was unable to pay for it in first round. However, Ms. Urassa stated that she had the ability to purchase the drips irrigation kits in the second round.

3.7 Vegetable selling points

Table 3.6 indicates the vegetable selling points. The findings reveal that 88% of farmers sold their veggie within their locations. The data justifies that there was a demand of veggie within farmers' locations and this was witnessed by the consultants during the survey, where three villagers wanted to purchase the veggie from Mr. Mustapha Ng'unda from Bomang'ombe area in Hai district. Moreover, in Gedamar village at Galapo ward in Babati district, the local market was improving after villagers' understanding on the importance of consuming vegetables on human health as reported by Ms. Aisha Ramadhani (21 years old):

> *"In the past the market of vegetable was a challenge as people were not aware of the important of eating green vegetables. The situation was worse as people preferred small fishes, but now they consume vegetables after understanding its importance in human health"*

Ms. Mwatatu Ramadhani (52 years old) from Gedamar village stated that the market improved because villagers understood when sprayed vegetables became fit for human consumption. She stated:

> *"In the past villagers hesitated to purchase vegetables because they were not aware on when the sprayed vegetables became fit for human consumption. Therefore, they were afraid of side effect of eating intoxicated vegetables. But now they understand when sprayed vegetables can be consumed"*

The study reveals that few veggie farmers have accessed the market outside their locations. These include Mr. Dodo Matambo who secured the market at Whiterose hotel located in Babati town while some famers from Hai district, for example Ms. Helen Mushi sold their vegetables in Kwa sadala, Moshi town, Arusha and Mbuyuni. Moreover, since every interviewed farmer stated that the adoption rate for the project was very high; the consultants anticipate that many farmers will grow veggie and this will make the supply to be greater than demand. This necessitates NCA to search for reliable markets for the veggie. Furthermore, NCA may establish the value addition/processing technology to farmers which will facilitate selling veggie and fruits at good prices and even store them when the price is not convincing.

Table 3.5: The vegetables selling points

Vegetable selling points	Frequency	Percent
Within location only	22	88.0
Within and outside location	3	12.0
Total	25	100.0

3.8 Veggie revenue information

Table 3.7 portrays that tomatoes, *loshuu* and *saro* gave the high revenue per week and Mnavu was the least. The revenue was high for tomato because of high productivity and price. Moreover, Saro earned a high price because it was sold continuously for average of 21 weeks while the *loshuu* and Chinese was sold consecutively for 14 and 12 weeks respectively. Mnavu was the least because it was usually not sold independently but it was mixed with other vegetables. Based on the findings the consultants recommend growing of saro, *Loshuu* and chinese if the farmer wishes to earn high profit margin. Tomatoes also were recommended if a farmer has adequate production capital. The study further reveals that every veggie was preferred differently based on locations and marketability. For instance *mnavu* was proffered more by farmers in Siha, *loshuu* in Moshi, spinach in Hai and Chinese in Babati districts. The consultants found that *mnavu* because of having little weight; it was sold when mixed with other veggies such as spinanch, Chinese, Swiss chard or fig.

Table 3.6: Veggie Average Selling and Revenue information (TZS)

Type of vegetables	Number of beds	selling revenue per week per bed	Number of selling weeks	Total revenue all weeks per bed	Total Revenue all beds all weeks First round	How many production times per year	Total revenue all beds per year
Chinese	3	8,125	12	101,833	294,000	3	859,000
Sukuma wiki	2	9,646	15	99,262	196,185	3	559,015
Saro	2	7,429	21	141,143	373,143	3	866,857
Amaranth (mchicha)	2	9,150	10	84,400	164,200	4	656,800
Fig-*Loshuu*	3	8,000	14	112,000	373,000	3	746,933
Mnavu-African nightshade	2	5,400	4	9,800	39,200	3	117,600
Tomatoes	14	94,318	10	1,412,50	15,550,000	3	33,900,000
Spinach	3	7,150	12	88,200	264,600	3	793,800
Swiss chard	4	8,000 26,000	16	128,000	512,000	3	1,536,000

3.9 Veggie Gross margins and returns information

The findings from Table 3.7 show that tomatoes had high gross margin compared to other veggie. The results also show that *saro* followed in terms of high gross margin score. The reason for this scenario has been explained in the previous paragraphs. However, the consultants have analyzed the returns for investment. i.e what does the primary capital yields. Despite the payback period analysis does not provide the information on whether the farmer earned profit or loss, it can give information about the cash flow of the veggie investment. Table 3.8 indicates that the returns for investment was higher for tomatoes (12 times of the initial capital), followed by Chinese (11 times) and *saro* and *loshuu* (both 8 times). The gross margins and returns for other crops are presented in Table 3.8. The data indicates that one would get high returns if he/she

grows tomatoes and Chinese followed by other veggie. The data demonstrates that, apart from tomatoes, Chinese had high returns compared to *saro* and *loshuu* despite its gross margin was less than the mentioned vegetables because it stayed for relatively short time and this reduced the farming costs such as pesticides, fungicides, insecticides, fertilizers and water for irrigation.

The survey revealed that farmers with many beds and those who supplied the veggies inputs on time earned the higher returns than those who did not. For example, Dodo Matambo with 6 beds of Chinese earned about 2,592,000 Tanzanian shillings per year while Mr. Mustapha Ng'unda with one bed of *loshuu* earned only TZS 307,400 per year. In the case on important of capital access to facilitate the veggies production, we take example of Ms. Rahel Urassa, a woman with disabilities at Ngombaru village in Siha district who had only one *sukuma wiki* bed. However, due to poor status of the households, she claimed that she was unable to operate her *sukuma wiki* bed because she lacked money to buy the fertilizers and insecticides. This situation forced her to use the local insecticides. The results may imply that poorest farmers should be facilitated to get capital for running of veggies farming until they gain ability to raise their own capital. Moreover, we insist the commercialization of the veggies farming where farmers will grow veggie when they have proper marketing strategies and earning expectations. The consultants recommend that subsequent growing of vegetables should target earning more income and profit through access of reliable markets.

Table 3.7: The Gross Margins and Returns Information

Type of vegetables	Number of beds	Gross margin per bed first round	Gross margins all beds first round	Gross margins all beds per year	returns as % of capital	How many times of the capital
Chinese	3	69,837	218,365	739,169	1,110	10
Sukuma wiki	2	68,164	141,254	471,392	558	6
Saro	2	109,361	309,464	789,229	292	8
Amaranth (mchicha)	2	58,588	135,388	533,800	659	7
Loshuu- Ethiopian mustard	3	81,717	195,733	746,933	764	8
Mnavu- African nightshade *Solanum nigrum*	2	(6,300)	53,100	26,250	173	2
Tomatoes	14	905,964	14,044,650	32,472,000	1,161	12
Spinach	3	55,483	166,450	669,750	466	5
Swiss chard	4	75,600	302,400	907,200	733	7

3.10 Impacts of veggie production to farmers

Veggie farmers asserted that they have realized impacts on income, other crops' production, assets increase, business capital, meeting education and health expenditures and house construction/maintenance. The consultants noted that a farmer may realize the impacts on not necessarily all variables. Moreover, the impacts extents varied depending on how long a farmer has been involved with veggies production. The data exposes that farmers had the minimum experience of three months in veggies production which was approximate one production season and the maximum time was 36 months (three years). The results from Table 3.12 indicate that

farmers have benefited from veggie production in many ways. In the following sections, we are going to discuss how veggies farmers realized impacts on different variables.

3.10.1 Impacts on income

Impacts of veggie production on income have been described well in the revenue, gross margins and returns sections. However, here we would like to extend the discussion of the impacts by focusing merely on women. The consultants revealed that veggie production has improved women confidence in supplying the family needs. For instance, Zaituni Omary (35 years old) from Gedamar village said that:

"Previously my husband did not take care of the family needs. Therefore, I decided to borrow a loan from VICOBA and I invested it into two beds of vegetables. I am now real benefiting from these two beds of vegetables because I get money for fulfilling my household's needs and I also consume the vegetables with my children" Also Also Hadija Juma (44 years old) from Gedamar village stated that:

"*Speaking the truth, this project is very good and beneficial to me as my husband can leave home without giving me some money for household's expenditure in the morning but I am grateful to God because now I can sell vegetables and get an average of TZS 3000 to 4000 per week and I use the money to buy cooking oil, tomatoes and cook my own vegetables. Sometimes, I use the money obtained from selling vegetables to buy some food. My husband usually gets surprised when he finds some food in the evening when he comes back"*

3.10.2 Impacts on Crops Productivity

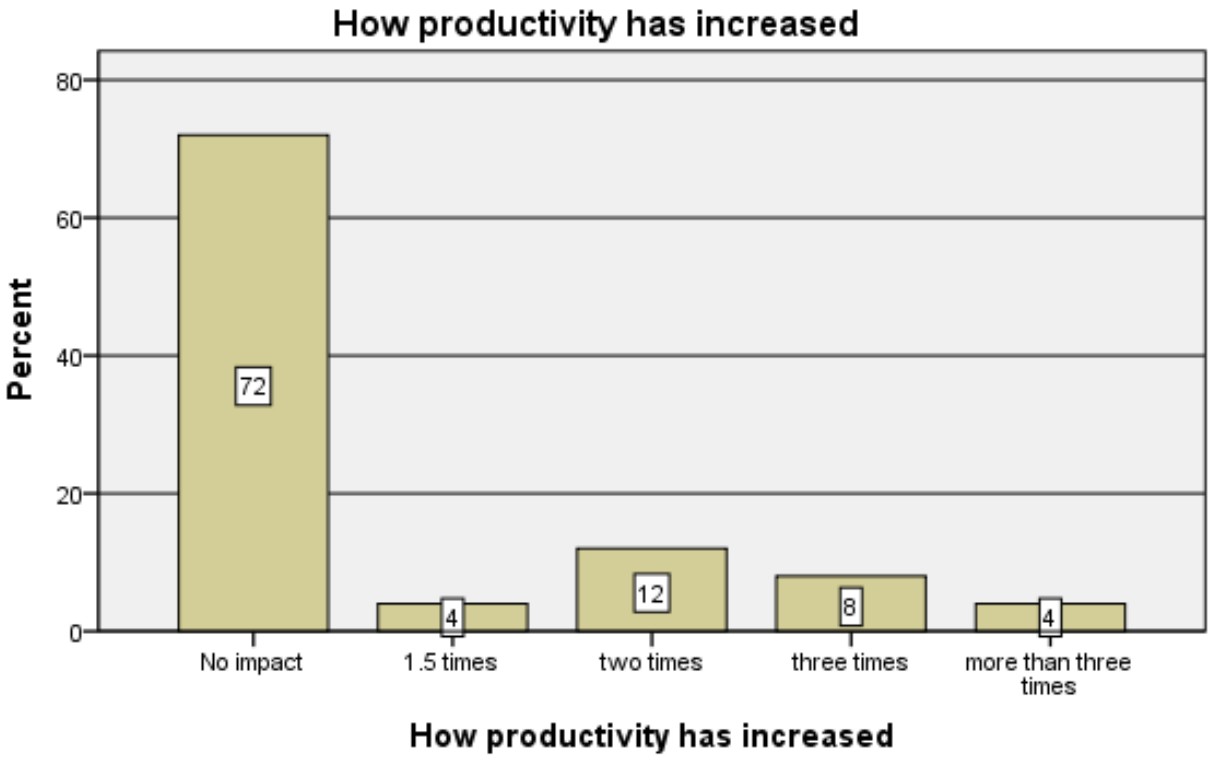
Data from Table 3.8 certifies that only 28% of veggie farmers have realized impacts on other crops' production and majority has registered impacts of two times production than before the introduction of the veggie project. The study reveals that 72% of farmers did not like to invest on other crops production after earning their income from the veggie selling. Importantly, we have noted that farmers were taught by the agronomists that they should consider the veggie production as an independent income generation activity. However, when they opted to invest in other crops, they earned more than previous yields. Mr. Dodo Matambo reported that before beginning veggie production he was harvesting only 50 bags of maize and 35 bags (100 kg) of cowpeas but he can now harvest 150 bags of maize and 60 bags of cowpeas in the same plot of land. Mr. Dodo acts as a change agent for the project and he has encouraged his fellow farmers to join the project. For instance he has assisted seeds Mr. Iddi Mohamedi and herbicides and insecticides Mr. Wiras Amma free of charge to encourage them to start veggie production.

Table 3.8: Impacts in Crop productivity

Impacts in crop productivity	Frequency	Percent
Yes	7	28.0
No	18	72.0
Total	25	100.0

Figure 2.3 presents changes of crop productivity brought by income earned from selling veggie. The response options were no impacts, 1.5 times, two times, three times and more than three times as indicated in Figure 2.3.

Figure 3.3: Increase of crop productivity though using veggie income



Results from Table 3.9 give the information about the asset increase status. The data shows that only 48% of the veggie farmers reported on assets' increase. Farmers confessed to buy assets such as land plots, motorbike, home utensils, TVs and sofa sets. Farmers acknowledged the increase of assets due to participation in the veggie farming activities as indicated in Table 3.8

Table 3.9: Assets increase

Do assets increased?	Frequency	Percent
Yes	12	48.0
No	13	52.0
Total	25	100.0

3.10.3 Consumption of veggie and increase on the number of meals

The findings from Table 3.13 indicate that the number of meals have increased from one to three. The number of meals increased because veggie farmers used the veggie income to buy some food. The data implies that NCA project has promoted the food adequacy to the veggie farmers in the project area. The intensity of impacts differed because of the differences in the number of beds and application rates of inputs among the veggies farmers. The findings show that farmers with many beds realized more impacts on number of meals. The information on the number of consumption of veggie per week indicates that the number of meals have changed from once to seven times per week with average of three times per week. Farmers also declared that production of veggies reduced the budget for buying vegetables and reduced the risk of consuming intoxicated vegetables. The data indicates that veggie production has played enormous role in improving the nutritious status of the veggies farmers. Mr. Mustapha Ng'unda

asserted that his medical doctor directed him that half of his meal's contents should be vegetables. It implies that if he could not produce vegetables, he could incur a lot of money to purchase vegetables.

3.10.4 Improvement in education

Table 3.10 shows the amount of funds used as education expenses. The results indicate that 44% of veggies farmers were having ability of paying for educational services after participation in veggie production. The results from Table 3.10 indicate that the minimum amount paid for educational services in the previous round was TZS 3,400 while the maximum amount was TZS 1,400,000. The amount of expenses varied because after introduction of the free education policy in Tanzania, parents have being exempted from paying fees in the government schools. However, parents have the responsibilities of buying the schools' uniform and stationeries for their children such as text books, exercise books and pens. Therefore, the veggie farmers whose children study in the government schools incurred small education expenditure compared to those studying in the private schools. For example, Mr. Bura John from Gedamar village used TZS 14,000 to buy stationeries for his children who studied in the government school.

The study found that some farmers opted to send their children in private primary and secondary schools after realizing that they have ability to pay for their children. Examples of these farmers include Mr. Dodo Matambo of Gedamar village in Gallapo Babati rural rural district whose children was studying in Singida School of accountancy and he paid TZS 1,200,000 per year. Mr. Dodo Matambo declared that if could not participate in NCA activities, he would not manage to pay the school fees for his secondary school children and even he could not manage to get money for buying agricultural seeds. Veggie production helped women to contribute to the education of their children by paying the school contributions, uniform and other school expenses. This fact was also witnessed by Ms. Mwatatu Rajabu (52 years old) from Gedamar village.

Table 3.10: Amount used as education expense

Amount used in TZS	Frequency	Percent
0	14	56.0
3,400	1	4.0
4,000	1	4.0
4,500	1	4.0
7,000	1	4.0
14,000	1	4.0
30,000	2	8.0
45,000	1	4.0
300,000	1	4.0
700,000	1	4.0
1,400,000	1	4.0
Total	25	100.0

3.10.5 Impacts on Health

The findings show that only 33% of farmers realized the impacts of veggie production on health as indicated in Table 3.10. The findings indicate that the amount used in health expenditures ranges from TZS 6,000 to 150,000 depending on how the health case was serious. The small amount was used for checkups and buying of drugs for minor cases while the large amount was

used to cover the hospital's admission costs and other complicated medical problems. Ms. Naomi Sawe from Roosinde village in Hai district used TZS 6,000 for buying drugs when she was sick while Mr. Wiras Amma contributed TZS 100,000 of the veggie income as health expenses for his relative who was admitted at Kilimanjaro Christian Medical Centre (KCMC) and Mr. Josephat Nyaki paid TZS 15,000 for health services. The two women beneficiaries were from Babati district.

Table 3.11a: Amount used in health expenditures

Amount used for health Expenses	Frequency	Percent
None (0)	21	67
6,000	1	3
8,500	1	3
12,000	1	3
15,000	1	3
30,000	2	6
50,000	1	3
100,000	2	6
150,000	1	6
Total	31	100

3.10.6 Veggie farmers Health insurance coverage

The results from Table 3.11 show that about 80% of veggie farmers were not covered by health insurance. When veggie farmers were asked why majority were not covered; they replied that they lacked knowledge on the importance of health insurance. Also the consultants observed during the survey, that some veggies farmers who were somehow well-off stated that they did not consider that it was essential to have the health insurance cover because they thought that they had a capability of meeting the health related expenditures during the survey. The famers' response signifies that they were not aware that insurance coverage serves a farmer during an emergence situation. If farmers were not covered by the health insurance services might use more of their income on health expenditures and they ultimately not realize full the impacts of the veggie production. The consultants found that few farmers were covered by health insurance coordinated by Tanzania Social Action funds (TASAF), which has strategic objective of offering the facilitation funds for establishment of economic activities and meeting the basic needs of the poor.

Table 3.11b: Health insurance information

Health insurance coverage	Frequency	Percent
Yes	5	20.0
No	20	80.0
Total	25	100.0

3.10.7 Impacts of veggie farming on house construction or maintenance

The findings from Table 3.12 indicate that only 12% of veggie farmers used their income for house construction or maintenance. Farmers stated that have used TZS 130,000 and 20 million as

minimum and maximum amount for house maintenance and construction respectively. The minimum amount was used to fix a door by Mr. Ramadhani Ibrahim (44 years old) while the maximum amount was used by Mr. Leonard Joseph (27 years) to build a house; of course, after earning income from tomatoes worth TZS 25.5 million. Moreover, Mr. Dodo Matambo (54 years old) used 8 million for house's construction. Majority of farmers (88%) did not use the money from veggie for house construction or maintenance because usually farmers did not save the money earned from vegetables but used it for buying the household's consumables.

Table 3.12: Income for house construction/maintenance

Value of income	Frequency	Percent
None (0)	27	88.0
130,000	1	3.0
300,000	1	3.0
8,000,000	1	3.0
20, 000000	1	3.0
Total	31	100.0

3.10.8 Impacts of veggie farming on business Capital

The findings found that only four farmers from Gallapo ward in Babati district used the income from veggie to expand their businesses. These were Mr. Leonard Joseph (27 years) and Mr. Wiras Amma (45 years) who used TZS 2,000,000 and 200,000 to expand their shop businesses. Moreover, Mr. Ramadhani Ibrahim used TZS 14,000 for ginger tea business while Ms Mwasiti juma (35 years) used TZS 5,000 for bans and potato chips businesses. The findings indicates that veggies farmers had not invested a lot in business because they usually not accumulate income from veggie but they use it to meet the immediate household needs and for paying the weekly payment in VICOBA groups. Mwatatu Rajabu (52 years old) from Gedmar village stated:
"Veggie farming provides money not only for purchasing the household needs but also it enables me to save weekly in VICOBA". The descriptive analysis data are presented in Table 3.13. Table shows a range of descriptive variables which have been already discussed in the previous section.

Table 3.13: Descriptive Data: Vegetable farmers

Variable (s)	N	Minimum	Maximum	Mean
Age of a vegetable farmer	25	20	70	44
Experience in farming	25	3	36	17
Amount used to buy assets	25	0	2,000,000	100,540
How many times you eat veggie per week before?	25	1	3	1
How many times you eat veggie per week after?	25	2	7	5
Number of meal before	25	1	3	2
No of meal after	25	2	3	3
Amount used to meet health expenses	25	0	150,000	20,060
Amount used to meet education expenses	25	0	1,400,000	101,516
Amount used to construct/maintain a house	25	0	20,000,000	1,137,200
Amount used as a business capital	24	0	675,000	28,708

3.11 Fruits Production

The consultants visited Edeni Plant-Strawberry group in Arumeru district, Weruweru group in Hai and Bwawani groups in Chalinze, Bagamoyo, district who were producing strawberry fruits in clusters.

3.11.1 Weruweru Strawberry group in Hai district

Strawberry groups in Weruweru district at Hai district was formed in 2012 with 20 members (14 females, 6 males). They started strawberry production after been sensitized by Mr. Cathbert Felix, the agronomist for Moshi, Hai, Vunjo and Rombo but strangely, they have never seen the strawberry fruits and they were not informed where the strawberry were sold. They have raised TZS 449,200 from VICOBA and they bought the irrigation kits to irrigate the 15 beds (of 8x1m) they have prepared. They anticipated that they would earn enough income from the strawberry production.

3.11.2 Edeni Plant-Strawberry group in Manyire village Arumeru district

The group has 9 members (2 males, 7 females). They have 13.5 (8x1m) beds and they grew strawberry in a cluster. Members stated that there was an adequate market for strawberry. They have searched the market in Kenya, Australia and Norway. During the survey, strawberry fruits grown in the cluster's plot were not yet harvested but one member, Mr. Mkongwe Vicent had harvested a total of 30 kg and he sold TZS 20,000 per kg. Group members stated that they were not able to meet the market demand because buyers demanded 150 kg per month but their production capacity was 60 kg per month. Deborah John's, one of the group members her husband was an IT expert and hence helped them to search for international markets. The group managed to access buyers, types of strawberry demanded and the strawberry specific attributes. Group members borrowed from VICOBA TZS 200,000, 500,000 and 1,000,000 and 2,000,000 and 4,000, 0000 for strawberry activities respectively. The group faced the challenge of freelance livestock who were destroying the strawberry gardens.

Farmers asserted that production of strawberry was very profitable. After seedlings transplanting, a farmer started harvesting strawberry after three months and this could be done in three consecutive years. In one bed of 8 x1m, a farmer usually harvested 1.5 kg two times per weeks, when the production was at peak, they harvested even 3 kg per bed. In average, one Seedling could produce one kg per month and one 8x1 m bed can accommodate 47 seedlings. The price of the strawberry prices ranged from TZS 10,000 to 20,000. However, most of the time was high. The production costs and gross revenue analysis for the strawberry fruits under cluster arrangement are indicated in Table 3.13.

The findings from Table 3.13 show that the costs and margin analysis for strawberry fruits per bed. The information was collected from the Eden plant strawberry group. The findings indicate that the production costs per bed per year, revenue and gross margins were TZS 1,049,988, 1,440,000 and 390,012 respectively. These data are obtained if the farmers sold strawberry at minimum price of TZS 10,000. However, according to Ms. Donna Mnele (an independent strawberry farmer from Njiro street in Arusha City), the price of strawberry ranged from TZS 10,000-20,000. Suppose the price rose to TZS 15,000, revenue and gross margins per bed per year would be TZS 1,110,012 and 1,630,462. Taking another scenario if farmers have five beds, they could earn a gross margin of 8,152,310 per year. The data implies that the strawberry growing was the lucrative activity and farmers would earn enough money if grew veggies in many beds. The margins increased in the second and third year because farmers did not incur the

fixed costs of investment which were incurred only in first year. Furthermore, good selling price was one of the reasons for earning adequate income. Table 3.13 shows that the return for capital at first round was one more time while in the second round was 3 times. The analysis assumes that the selling price would be fixed. In the normal situation prices varied, implying that strawberry may be sold relative lower or higher prices.

Table 3.13: Strawberry-8 x1m bed costs (total beds =13)

Cost items	**Year 1**	**Year 2**	**Year 3**
Fertilizers-Organic booster	11,538	11,538	11,538
Kits costs	20,000		
Composite	450		
Saw dusts	3,000	3,000	3,000
Labour charges	150,000	150,000	150,000
Net and iron stand	130,000		
water tank	250,000		
seeds 40 seedlings x3000	120,000		
water charges	360,000	360,000	360,000
herbicides	5,000	5,000	5,000
Total costs	**1,049,988**	529,538	529,538
Selling -10,000kg per bed per year	**1,440,000**	1,440,000	1,440,000
gross margin for three years	**390,012**	**910,462**	**910,462**
Production times per year (months)	**12**	**12**	**12**
Return of capital %	**137**	272	272
How many times	**1**	3	3

3.11.3 A successful story of Ms. Donna Mnele-Individual strawberry grower

Ms. Donna Mnele from Njiro area in Arusha had 6 (20x1m) beds, she started with 1.5 capital, she bought 700 seedlings for a price of TZS 1,000 per seedling, iron stand TZS 240,000, she bought a net at TZS 250,000, spraying costs was TZS 15,000, fertilizers cost per month, TZS 14,000, and water charges TZS 12,000 per month. Now she earned 500,000-1 million per month for three years consecutively**.** Ms**.** Donna Mnele sold her strawberry at retail price of TZS 10,000-15,000. She had accessed tourist market in Ngorongoro national park called *"and beyond-tourist hotel"* and they told her that they could accept her order if she could supply 30kg three times per month but she did not have such capacity. The production and sales information indicates that fixed production costs could be paid within three to four months. Moreover, farmers could incur roughly TZS 50,000 per month while earning a minimum amount of TZS 500,000 and earned a minimum of gross margin of TZS 450,000 per month! Indeed, strawberry production was a lucrative activity! During the survey, the Edeni strawberry group visited Donna and they agreed to sale the strawberry collectively with her to so as to meet the market demand. Ms. Donna Mnele also invested TZS 5 million for operating the strawberry selling points where she would process and sell strawberry juices and other related juices.

Picture 3.1: Ms Donna's well structured strawberry garden in Njiro Arusha city and when he was interviewed by consultants


3.11.4 Bwawani fruits farmers cluster

Bwawani fruits farmers had four clusters with 60 members who were involved with tomatoes, cucumber and papers production. There were 4 groups with members as follows:

i. Motomoto: 17 members (Male 3, female 14)
ii. Maendeleo: 17 members (3 female, 7 Male)
iii. Upendo : 8 members (3 male, 5 females)
iv. Tomato production group (has no name) 12 members: (3 male, 9 females)

Some of the group Members: Ramadhani Milela (50 years), Yahaya Ali Meta (45 years) and Juma Tembo (44 years) asserted that they joined the group in order to facilitate the collective production and marketing. In order to run the group successfully, they composed the groups' bylaws where there was a penalty when the member did not participate in the group activities or did not attend the group meeting. The cucumber takes 39 days from seedling planting to harvesting. In one bed of 1x10 meter, a farmer usually harvested 3-5 cucumbers per seedling making a total of 66 cucumbers and each cucumber was sold at 200-500/TZS. In November to March price was usually TZS 350-500. During the survey, farmers stated that market was not a problem. They have received various orders but they were unable to satisfy them because they did not have cucumbers to sell. The others advantages of cluster production were: facilitating sharing of market information, advertising and promotion, also it reduced the contributions for marketing charges. Farmers stated that they sold their cucumbers in Iringa, Dsm, Bagamoyo, chalinze, Morogoro and Dodoma.

The cucumber production costs and margins analysis in Bwawani cluster is presented in Table 3.14. The data shows that the production costs for the first round was TZS 36,475 where the revenue and gross margins were TZS 792, 000 and 755,525 respectively. The gross margins for the second, third and fourth rounds were TZS 785,958, 785,958 and 782,525 respectively. Bwawani fruits cluster farmers reported that they could harvest 66 cucumbers in a bed 24 times and each seedling produced 5 cucumbers which could be sold at a price of TZS 100-500. The costs and gross margin analysis indicates that farmers got a reasonable gross margins after covering the fixed costs in the first round. Also the many the number of beds, the more the profit earned by farmers. Farmers asserted that could even produce cucumber five times a year and if

they did so they could accrue an average of 55 times of the invested capital. During the survey fruits cluster farmers in Bwawani reported that they sold their previous cucumbers in Dar es salaam. However, they argued that they received the supply order from buyers in Dar es salaam but they were not able to supply cucumbers during the survey time because cucumbers were not yet harvested. Farmers further reported to use Darlina F1 seeds which were distributed by Baston Tanzania. This variety was prolific, begins producing cucumber only in 21 days, compared to 54 days of the local variety and the size of cucumbers were large and attractive and that was why their cucumbers were demanded by many buyers.

Table 3.14: Costs and Margins analysis for Cucumbers

cucumber costs per bed-Total beds=48					
Cost(s)	**First round**	**Second**	**Third**	**Fourth**	**Total**
Seeds	1,667	1,667	1,667	1,667	6,667
Bed preparation	2,000	2,000	2,000	2,000	8,000
Fertilizers	625	625	625	625	2,500
Ridomil-Fungicide	167	167	167	167	667
Profecron-insecticide	833	833	833	833	3,333
fungicide-ibony	250	250	250	250	1,000
Irrigation kits	17,000	-	-	-	17,000
Raising stick	1,600	-	-	1,600	3,200
Staking pool	10,000	-	-	-	-
Strings	1,833	-	-	1,833	3,667
harvesting costs	500	500	500	500	2,000
Total Costs	**36,475**	**6,042**	**6,042**	**9,475**	58,033
Revenue	**79,2000**	**792,000**	**792,000**	**792,000**	3,168,000
Gross Margin	**755,525**	**785,958**	**785,958**	**782,525**	3,109,967
production times per year	4	4	4	4	16
Return of capital %	**2,171**	**13,109**	**13,109**	**8,359**	5,459
How many times	**22**	**131**	**131**	**84**	55

Picture 3.2: Cucumber production at Bwawani area under cluster arrangement

3.11.5 Tomatoes production costs and margins

The consultants also interviewed the tomatoes farmers cluster in Bwawani area in Bagamoyo district. Fruits cluster farmers responded that usually tomatoes were grown in twice a year. They further exposed that one tomato bed usually accommodates 26 tomato seedlings which can produce 20 kg each. The 12 cluster members had 13.5 beds (of 10x1m), implying that each member has an average of one bed. Findings from Table 3.15 present tomatoes production costs and margins. The findings indicate that if the selling price per kg was TZS 1000, the gross margin for the first and second round was 670,830 and 739,089 TZS respectively. Farmers asserted that in a year the demand of tomatoes was usually high except in August and September where they coud sell at TZS 300 per kilogramme. The prices of tomatoes usually rise up to TZS 3,000 per kilogramme during scarcity season; usually from October to July in each year. For instance, during the survey, the price of tomatoes was TZS 2,000 per kilogramme. Nonetheless, the consultants decided to calculate the gross margins using the price of TZS 1,500 per kilogramme, which was lower than the price offered in the market during the time of survey. If the price was 300 per kilogramme, which was the lowest, a farmer may earn a gross margin of **TZS** 46,830 and 115,089 in the first and second round respectively. During the rainy season, the prices increased due to prevalence of pests, fungi and diseases which restrained production of tomatoes in large volumes.

Is it profitable business? The consultants interrogated cluster farmers if the price of TZS 300 per kilogramme was not too low to sell tomatoes. Farmer replied that if a farmer grew maize in one acre he usually harvested only a maximum of 5 bags and if he decided to sell at the maximum price of TZS 50,000 would earn TZS 250,000 only which was equivalent to two tomatoes beds' revenue. This analysis signifies that the cluster tomato business was efficient and effective than maize production.

However, in order farmers to reap the desired gross margins, it was essential to conduct the market research and consider the production and marketing risks. NCA may devise various strategies to increase the profit margin of tomatoes. These strategies include introducing

processing industries for tomatoes to facilitate the value addition activities. Also studying the production seasons of other areas would facilitate fulfillment of the market demand. The value of returns to capital expresses that the return for tomatoes was 7 and 19 times for the first and second production rounds respectively. The data indicates that if tomatoes production was well structured, it could bring large impacts to farmers in respective clusters. Nonetheless, since investment costs for tomato were high; the production did not align with the micro investment notion; perhaps fitted for Next level investment.

Table 3.15: Tomatoes production costs and margins

Tomatoes per bed-Total beds=13.5 (10x1 m)		
Cost item(s)	First round	Second round
Seed	5,926	5,926
Land preparation	3,704	-
Bed preparation	4,000	4,000
Irrigation kits	33,333	-
Inner poll pipe	3,704	-
Elbow	6,000	-
Glue	3,000	-
Simtank contribution	11,111	-
Pesticides and insecticide	7,407	7,407
Fertilizers	7,259	7,259
Petrol costs	15,319	15,319
Strings	3,704	-
Staking pool	3,704	-
Weddings	1,000	1,000
Total costs	109,170	40,911
Revenue	780,000	780,000
Gross margin first round	670,830	739,089
Production times per year	2	2
Return of capital %	714	
How many times	7	

3.12 Challenges in Vegetables and fruits production

The consultants observed the following challenges:

3.12.1 Water inadequacy

There was no adequate water for irrigation in some areas example at Gedamar village in Babati district. Mr. Dodo Matambo, an agripreneur and a change agent farmer reported that three farmers have dropped out from the project in Gedamar village in Babati district because of water inadequacy problem, especially during the dry season. Also water inadequacy made the veggies to stunt and hence reduced the yields, revenue and gross margins. The problem of water scarcity affected more women than men and made them to hesitate to increase number of veggie beds. For instance, Maria Damiano (56 year old) in Gedamar village responded the following when she was asked her future plan of expanding veggie production.

"Currently, I have two beds of vegetables, but I don't have a plan to increase number of beds due to unreliable water supply in my village. On top of that we are now heading to dry season where the water scarcity problem will be even tense. Therefore, if I say that will increase number of beds, I will be deceiving you!"

3.12.2 Fluctuation of Market prices for vegetables

The consultant found that the market were there but the price kept fluctuating and this kept farmers hesitant thinking what will happen if many farmers will join the veggie project. For example it happened that farmers from Moshi town agreed with buyer to buy veggie at TZS 1,000 per bunch but when a farmer reaches at the market, the prices offered ranged from TZS 500-700 per bunch and this situation discouraged them.

3.12.3 Mixture of beneficiaries

The consultants found through observation that three beneficiaries especially in Moshi town were not poor people. The picture 3.1 shows the houses of the veggies farmers who were visited by the consultants. Moreover, picture 3.2 shows the surroundings and a garden of Ms Rachel Urassa, a woman with 70 years and who was a leg disabled. Through observing her home surrounding and environment the consultants thought that Ms Rachel Urassa was the type of people who the project should concentrate on.

Picture 3.3: Well-off farmers' house in Moshi district

Picture 3.4: Ms Rachel Urassa at his house and garden

3.12 .4 Veggie pests and diseases

The study found that there was prevalence of pests and diseases among the veggies' plots. The consultants also revealed that some farmers were having little knowledge on the application of pesticides and insecticides. For example, Ms Rose Timoth from Soweto area in Kilimanjaro region sprayed a lot of pesticides in her tomato garden but still the problem prevailed. Her garden smelt a lot of pesticides and fungicides. The agronomist told Ms Rose that she sprayed the pesticides incorrectly. Also she told us the tomatoes were affected by unknown disease as shown in Picture 3.3.

Picture 3.5: Unknown disease for tomatoes from Ms Rose Timoth's field

3.12.5 Low coverage by health insurance services

The findings show that only 20% of farmers were covered by health insurance services. Farmers confessed that they did not have adequate knowledge on the importance of health insurance services.

3.13 Veggie and fruits Farming Recommendations

- NCA should facilitate the availability of water for irrigation for areas with drought such as Gedamar, Gallapo Babati because the present water tank of 5,000 litre volume had no capacity to supply the required water to all project's beneficiaries. NCA can facilitate the purchase of the large water tank of 10,000 or even 20,000 litres to facilitate veggie irrigation. The tank may be provided as a loan which will be repaid by veggie farmers through IR VICOBA groups
- NCA should facilitate the availability of reliable markets for veggie and fruits, We recommend that expansion of veggies and fruits production should match with market search/assurance
- Veggie and fruits farmers should be frequently trained on veggies and fruits production practices, including proper applications of pesticides, insecticides and fungicides
- The project should help the poorest people to climb the ladder of poverty. It can offer them initial loan as capital through VICOBA which should be repaid in a period of one year.
- Veggie and fruits farmers should be educated on the importance of health insurance. As the study revealed that majority of veggie farmers were not covered by health insurance except 20% of farmers. Insurance of health treatment is essential since health charges are very expensive if farmers face complicated health cases. Therefore, it is economical to pay for insurance charges than paying for the actual health costs and in most cases, when health problem occur, sometimes farmer would not have money to pay for it. Hence NCA should facilitate the access to insurance cover for veggie and fruits farmers
- NCA should encourage many farmers to grow the strawberry since the consultants found that farmers had not met the strawberry market demand.
- Farmers should be encouraged to add value to fruits. They can process the strawberry blended juice or use the strawberry in yoghurt. Also they can produce the tomato paste and processed cucumber products. For instance, Ms Donna, independent strawberry famer from Arusha city had invested TZS 5 million for opening of the strawberry juice point in Arusha city where she will use some of her strawberry for juice processing. This initiative should be imitated by other strawberry farmers.
- As one of the market strategy, many fruits clusters should be established to enhance the continuous fruits supply in the market throughout the year as demanded by some buyers. For example “and beyond tourist hotel” demanded 30 kg of strawberry three times per week but farmers could fulfill this order.

4.0 POULTRY KEEPING COSTS AND ITS IMPACTS

4.1 Introduction

This chapter presents the poultry production costs and margins, and the impacts of poultry keeping. The chapter presents the extent to poultry keepers have realized impacts in food productivity, income, food adequacy, education and health, business capital and house construction or maintenance.

4.2 Poultry keeping demographic information

The demographic information for the poultry keepers from Kilimanjaro and Morogoro regions are presented in Table 4.1.

4.2.1 Sex of the poultry keepers

Majority (73.3%) of the interviewed poultry keepers were females. The findings indicate that women were in forefront in poultry project. Undeniably, ownership of poultry project was almost entirely in the hands of women and served as source of cash income for the poor rural families (Alam, 1997). In addition to that, was because the poultry production activities were done at backyard in home environment where a woman could keep the eyes easily while taking other household's responsibilities. This was stressed by Ms Esther Mohamed (42 years old) during FGD at Kiyunga Darajani who stated:

"Speaking the truth that before this project, I had nothing worthy to do, but now I thank God and I am happy that I have something to do here at home. Due to sickness condition of my mother I couldn't go away and leave her for long time. But since I started this project, I can now take care of both my poultry and my mother".

Another emphasis came from Agnes Majole (53 years old) from Dumila, who said;

"I like this project because as a house wife, I can actively feed my chickens while I am continuing with my routine domestic chores. I real like this project!" The two cases imply that success and sustainability of the poultry project lie within the women sphere.

Table 4.1: Demographic and Socioeconomic characteristics of poultry keepers

Demographic &socio-economic characteristics	Frequency (N=30)	Percentage
Sex		
Male	10	33.3
Female	20	66.7
Total	**30**	**100**
Educational Level		
Primary Education	22	73.3
Secondary Education	7	23.3
Tertiary Education	1	3.3
Total	**30**	**100**
Marital status		
Married	23	76.7
Divorced /Separated	2	6.7
Widow/widower	1	3.3
Total	**30**	**100**
Age group		
18 to 35 years	10	27
36to 45 years	11	36.7
46 to 60 years	6	20
>60 years	3	10
Total	**30**	**100**
Experience in the project		
1 to 12 months	14	46.7
13 to 24 months	13	43.3
25 to 36 months	3	10
Total	**30**	**100**

4.2.2 Education Level of the Poultry Keepers

Findings from Table 4.1 indicate that primary education was attained by majority (75.3%), followed by secondary (23.4%) and tertiary (3.3%) education (a certificate in particularly). The education data presents majority of people who have little opportunity to be employed in formal sectors and hence they are likely to engage in poultry production. However, as data indicates that majority of keepers possess the primary education it imply that they can be trained on poultry management practices.

4.2.3 Age of the Poultry keepers

With regard to age, 27% of the poultry were having the age range of 18 years to 35 years. The data father reveals that male youths were 2% while the female youths were 25%. The findings indicate that female youths were dominating. This was healthy for the project as it was implemented by productive age group. On the other hand 10% of the poultry keepers were above 60 years old. It implies also that the project acts as a means to employment for elders. As we know that people at this age are retired from all forms of employment (formal or informal) and mostly were depending on either children or relatives for basic needs such as food, clothes and health services. As it was confessed by Mr. Nassoro Kibunda (72 years old) from Kiyungi darajani village:

"*This project acts as my redeemer because at this age (72 years), I can't do the manual work like crop cultivation. I have received the first batch of 100 chicks of which I took great care of them until they reached selling stage. Fortunately there were about 40 cocks of which I sold for TZS 15000 each. I used the money to buy new chicks, purchasing household's needs and expanding*

the poultry house. The remaining chickens continue to lay eggs of which some I eat and sell others at TZS 300 each and 9000 for a tray.

4.2.4 Relationship between sex and other socioeconomic variables

The findings from Table 4.2 present the relationship between sex and other socio-economic variables. The Table shows that females were more educated in secondary school than males. Hence, it was not surprising if their performances would be better than males. Also only one male possessed the tertiary education. Since poultry keeping required the basic knowledge, it was not necessary for a keeper to possess the tertiary education, despite the one who possessed it might be more advantaged than others.

The findings also indicate that more women were married than men while two women were separated and one was widow. The study found, the married couples could shared resources and made keeping activity smoother than the single ones. Moreover, the divorced/separated women required more assistance in terms of capital compared to married couples.

Table 4.2: Relationship between sex and other socioeconomic variables

Variables	**Sex of the respondents**				**Total %**	
	Male		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Educational Level						
At least Primary Education	7	23.3	15	50	22	75.3
At least Secondary Education	2	6.7	5	16.7	7	23.4
Tertiary Education	1	3.3	0	0	1	3.3
Total	**10**	**33.3**	**20**	**66.7**	**30**	**100**
Marital status						
Single	1	3.3	3	10	4	13.3
Married	9	30	14	46.7	23	76.7
Divorced /Separated	0	0.0	2	6.7	2	6.7
Widow/widower	0	0.0	1	3.3	1	3.3
Total	**10**	**33.3**	**20**	**66.7**	**30**	**100**
Age group						
18 to 35 years	2	6.7	8	26.7	10	33.4
36 to 45 years	3	10	8	26.7	11	36.7
46 to 60 years	3	10	3	10	6	20
>60 years	2	6.7	1	3.3	3	10
Total	**10**	**33.4**	**19**	**66.7**	**30**	**100**
Experience in the project						
1 to 12 months	5	16.7	9	30	14	46.7
13 to 24 months	4	13.3	9	30	13	43.3
25 to 36 months	1	3.3	2	6.7	3	10
Total	**10**	**33.3**	**20**	**66.7**	**30**	**100**

In terms of age group, many women were youths aged 18 and 36 years and were single. It implies that the project helped them to be independent and run their lives smoothly without depending on men. This might protect them from being deceived by men compared to when they

did not have any economic activity to engage in. In terms of poultry keeping experience, Table 4.2 shows that women were having long keeping experience than men. It implies that women adopted the project earlier than men. This means that more awareness on the adoption of innovation (poultry production) was needed for men so that they could join the project.

4.2.5 The purpose of keeping poultry

Majority of the respondents (73.3%) reported to keep poultry for the purpose of selling meat, while 23.3% of them kept for the purpose of selling both meat and eggs. This was due to the reasons that keeping poultry for eggs purpose was expensive and return on the investment took long time that was five to six months compared to three months of selling chickens for meat. It can be interpreted that keeping poultry for eggs selling took long time to recover the initial capital. However, the interpretation is not direct because it depended on circumstances. For instance, when the keeper had many chickens that lied large number of eggs, it might be profitable to keep layers because a keeper could sell eggs and buy chicken feeds per week. However, if the number of laid eggs was small it was better to sell chicken because the chicken feeds' costs exceeded the revenue generated from eggs and hence it was not profitable to keep layers. A forty two years old keeper, Ms. Georgina Mwagala in Dumila disclosed that:

"I have decided to join the poultry business because it takes few months to rear the chickens before selling them. I can keep three to four rounds per year and hence I can more profits."

Table 4.3 shows that large proportion of women (50%) poultry keepers were keeping for selling meat; this is due to the fact that women didn't have enough capital for long time investment. During the survey, the poultry keepers complained that feeds were very expensive because of maize scarcity where the price of maize bag reached TZS 80,000 per bag in Kilimanjaro region and this automatically raised the price of feeds. Ms. Lilian Kiwelo, a woman aged 36 years from Moshi rural district reported that in August 2019 her chickens consumed feeds costing TZS 45,000 per week while she sold eggs and earned 30,000 per week and hence she was making a loss of TZS 15,000 per week. Therefore, it was logical for many women to keep poultry for meat purpose in three months than keeping layers who laid eggs after five months. Ms. Ester Mohmed (42 years old), from Kiyungi Darajani also said:

> *"The big challenge I faced in this project was lack of money for purchasing feeds especially for the first round chicks. These chickens are eating a lot and therefore a lot of money was needed for purchasing feeds. Whenever, I found that feeds were not enough, I started to be afraid….. However, I didn't lose hope, instead I got strength from my children and I struggled until I got some money for feeds' purchase. Finally, I sold them and become stable".*

Table 4. 3: The relationship between Purpose of keeping poultry and sex of the respondents

Purpose of keeping poultry	**Sex of the respondents**					
	Male		**Female**		**Total**	
	Frequency	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percent**
Meat selling	7	23.3	15	50	22	73.3
Meat and eggs selling	2	6.7	5	16.7	7	23.3
Eggs selling	1	3.3	0	0	1	3.3
	10	**33.3**	**20**	**66.7**	**30**	**100**

4.3 Number of initial poultry and subsequent poultry

Table 4.4 presents the number of initial chicks and subsequent chicks kept by the poultry keepers. The findings indicate that the minimum number of chicks were 20 kept by Rev Graceford Mahingo at Zombo village in Kilosa district. The table further shows that majority of keepers started with 100 chicks except Celina Kazimoto who started with 100 chicks but she reached the maximum of 500 chicks in the fifth round. She asserted that she increased the number of chicks because poultry keeping had supplied her basic needs. For instance, they had bought sofa sets worth TZS 400,000, drilled the water well worth TZS 5 million and paid the school fees for her children of TZS 1million per year. Moreover, Ms. Anna Mbowe, Mr. Mwanga Adam and Mr. Mbwana Mohamed started with 350 and 200 chicks respectively. Table 4.4 shows that the poultry keeping experiences ranged from 8 to 36 months. The data indicates that majority of keepers had enough experience in poultry keeping. The data also indicates that many keepers had kept poultry more than one round. The data shows that Ms. Celina Kazimoto and Ms. Anna Mbowe has kept poultry five times while Ms. Janeth Msindo and Mr. Mbwana Mohamed four times and others such as Ms. Lilian Kiwelo and Mr. Salum Hilary three times. The reaming keepers had kept poultry two or one times as indicated in Table. Keeping chickens for many rounds by poultry keepers depicts that they were benefiting from poultry production as confirmed by Ms. Janeth Msindo: *"I continue keeping because of the benefits I accrue from keeping such as paying the education expenses for my children and meeting other basic needs for my household."*

Table 4.4: Initial and subsequent poultry up to July 2019

S/No	Name of Keeper	Location	Initial poultry	Second	Third round	Fourth round	Fifth round	When started months
1	Salma Miraji	Mijogweni Hai	100					9
2	Ester Mohamed	Mijogweni Hai	100					9
3	Nassoro Kibunda	Mijogweni Hai	100	100				9
4	Salma Daudi	Kiyungi-Hai	100	200				9
5	Rahel Juma	Mvuleni Moshi rural	100	100				9
6	Lilian Kiwelo	Mawanda-Moshi rural	100	170	300			9
7	Anna Mbowe	Kingereka-Hai	350	250	200	200	200	24
8	Michael Ngowi	Mrimbo-Mwika-Moshi rural	100	200				9
9	Janeth Msindo	Magole-Kilosa	100	150	100	300		36
10	Mwanga Adam	Magole-Kilosa	200	350				24
11	Jackson Msanjila	Dumila-Kilosa	100					8
12	Mbwana Mohamed	Dumila-Kilosa	200	200	150	100		36
13	Salum Hilary	Dumila- Kilosa	100	100	100			24
12	Emmanuel Upamba	Mandela-Kilosa	100	100				9
14	Charles Mbasha	Magole-Kilosa	100	200				10
15	Rev Graceford Mahingo	Zombo-Kilosa	20	60	100			24
16	Celina Kazimoto	Dumila-Kilosa	100	150	200	300	500	15

4.4 Poultry keeping's costs analysis

Findings from Table 3.5 indicates that the number of minimum chicks were 50 while the minimum and maximum number of chicks survived were 35 and 285 chicks respectively. The data shows that average survival rate were 91% which was very recommendable by the veterinary officers. The NCA arrangement was offering first 100 chicks of the first batch free of charge to encourage them to adopt the project. Rev. Graceford Mahingo (56 years old) from Zombo village, Kilosa district, reported that among the 60 bought chicks for the second round, 25 chicks died. Also Mr. Mbwana Ibrahim (48 years old) from Dumila village in Kilosa district reported that for the second round he bought 150 chicks but 120 chicks died and 30 chicks stunted and he failed to sell but he consumed them. He argued that the breed of that batch was having a problem, but he failed to ascertain clearly what the problem was.

The data from Table 4.5 indicate that the average total costs of poultry keeping were TZS 1,302,733. Total costs include the costs for buying the first day old chicks, chicken house, feeds, vaccination and drugs and other costs. Other costs include the cost of purchasing the feeds consumption dishes, saw dusts and transportation costs. Keepers reported that sometimes the price of chicks included the transportation costs. The price of chicks ranged from TZS 1,200-4,000 depending on the whether the transportation costs were included in prices' determination and the age of the chicks also determined the price of chicks. For example Rev. Graceford Mahingo from Zombo village in Kilosa bought one chicks at a price of TZS 4,000. Keepers reported that they had being trained by the veterinary officer to reduce the costs of poultry keeping by making or purchasing the feeds processed in their locations. They bought only beginning feeds from Silverlands Company which was called "starta mash" at a price of TZS 65,000 for a bag of 50 kg. Then, Silverland Company sold the feeds of broiler growers and broiler finisher at a price of TZS 59,500 and 57,000 per bag of 50kg. However, keepers have been instructed to buy the feeds from a local processor who sell at a price of TZS 30,000 to 35,000 per bag. The feeds contained all essential ingredients as those sold by Silverlands Company. Keepers have also been trained to prepare feeds and incurred the costs of TZS 25,000 per bag.

Surprisingly, the consultants noted that in order to reduce the keeping costs some keepers fed their chickens contrary to the veterinary officer's recommendations. For example Mr. Jackson Msanjila (40 years old) from Dumila Kilosa fed her poultry food wastes from the restaurants; where he washed the food wastes and then dried them in the sunlight for two days. He asserted that he could not see any problem and his chicks were healthy as if he fed them the feeds recommended by the veterinary officer.

Coming to the poultry house, NCA gave a loan of TZS 600,000 for initial batch of the keepers to construct the chicken house but this money should be repaid after selling the chickens of the first batch. The consultants found that keepers acknowledged this NCA initiative but they started that the time sat by NCA to pay the loan was not enough. They requested a period of two keeping rounds to repay the poultry house's costs. This strategy encouraged many keepers to adopt the project unless otherwise they could not afford to construct the poultry house using their own funds. Ms. Salma Shabani Daudi (58 years old) has started repaying TZS 200,000 (as installment of TZS 600,000) poultry house's loan to NCA.

The study finds that some keepers kept poultry half local. For example, Rev. Graceford Mahingo kept the poultry in his house and allocated a special room for them. He spread the saw dusts within the room and the saw dusts were replaced after three days. Also the chickens were allowed to search for grasses and other insects themselves and he fed only little amount of maize

bran and some small fishes in the morning and evening. Also some keepers kept poultry at their house or incurred low costs of poultry house's construction or maintenance. To mention a few, Ms, Esther Daniel (40 years old from Dumila village (keep poultry in the living house) and Ms. Milka Semeho (62 years from Zombo village in Kilosa) kept the chicken in his house) and allowed them to be free to search feed.

Some keepers also constructed their poultry houses using their own design, for instance Mr. Emmanuel Upamba (43 years old) from Mandela village in Kilosa used TZS 500,000 and Mr. Isaya Sanga used TZS 320,000 to design his own poultry house. Ms Pendo Samwel (24 years old) also used TZS 300,000 for the poultry house's construction. However, Ms. Celina Kazimoto (25 years old) from Dumila village) used TZS 1,400,000 to construct the poultry house which accommodated 500 chickens.

The costs analysis indicates that the amount of variable costs varied with the number of chicken kept. It implies that keepers with high number of chickens incurred more variable costs compared to those with small number of chickens. The consultants found that it was expensive to keep chicken during the rainy season because there was a prevalence of many pests and diseases and this increased poultry costs and exposed high keeping risk to the poultry keepers. Therefore, majority of keepers kept chicken during the dry season.

4.5 Revenue, Gross margins and returns analysis for poultry keeping

4.5.1 Poultry keeping revenue analysis

Findings from Table 4.5 also show that the minimum revenue was obtained by selling 48 chickens by Rev. Graceford Mahingo was TZS 420,000 while the maximum revenue of TZS 3,526,000 was obtained by selling 340 chickens at TZS 10,000 and eggs worth TZS 126,000. The data indicates that revenue varied among keepers for various reasons: firstly, the chicken selling price which ranged from TZS 7,000 to 18,000 TZS. However, the majority of keepers (70%) sold their chickens at TZS 10,000. Therefore, a keeper earned a higher margin if he/she sold the chicken at a reasonable price and the vice versa was true. The second reasons which determined the revenue was the quality of the chicken. This was also related with price, usually, chickens with low weight and quality attracted low price and this ultimately affected the revenue earned by keepers. The third reason was marketing demand. The price depended on how many chickens were supplied to the market; the large the quantities supplied, the low the price. Moreover, if a keeper was having a reliable buyer, the selling price and revenue increased, otherwise, decreased. During the survey especially in Kilosa Morogoro region, there was a high demand of chicken but keepers complained that the selling price of TZS 7,000 or 8,000 offered by buyers were low to break even. Other reason which determined revenue was adherence to good poultry practices which controlled pests and diseases because vulnerability of pests and diseases for poultry reduced the revenue of the poultry keepers.

4.5.2 The gross margin analysis

The analysis of gross margins show that only 47% of keepers could pay the poultry house in the first round and 53% got loss if they have to pay the poultry construction costs of TZS 600,000 in the first round. The analysis show that majority of keepers recovered all keeping costs in the second round. The gross margin of poultry for first round for 100 chickens was (57,892) TZS while in the second and per year round was TZS 428,392 and 856,784 respectively. In the first round the margin was negative because keepers covered the fixed costs of poultry house and

dishes. The findings suggest that keepers should be allowed by NCA to pay the poultry house costs in the second round, in order to allow keepers to expand the poultry keeping activity.
The findings also indicate that keeping large number of chicken increases the gross margins for keepers because of the economies of scale advantages. For instance, the high revenue of TZS 1,641,000 was attained by Ms Esther Daniel for the first round after selling 285 chickens at a price of 9,000. Also she incurred low costs of TZS 300,000 to construct the poultry house and she prepared feeds herself. Moreover, Noel Mayungu incurred a relatively higher loss because among 100 chickens only 79 survived; 17 died and 4 were used for home consumption. It implies that the gross margins was affected largely by the survival rate of the chicken and other factors that affected the selling prices as explained in the previous section.

Was poultry keeping profitable? Yes, but a keeper should adhere to good keeping practices as recommended by the veterinarian. Also a keeper should keep poultry more than one time and increase the number of chicks each round to enjoy the economy of the scale advantages. The consultants noted that keeping relatively higher number of chicks helped keepers to recover the fixed costs of poultry house construction and feed dishes costs early. Also they should strive to prepare feeds or purchase the locally prepared feeds which cost less. Furthermore, the veterinary officer recommended the shortest keeping time, say of three months and keeping poultry in the dry season was recommended than in wet season. The return analysis shows that the return of capital of the poultry keeping was 2 times of the invested capital.

Table 4.5a: Costs, revenue, gross margins and impacts variables for poultry keepers

Variable (s)	N	Minimum	Maximum	Mean
Age of a poultry keeper	30	20	72	42
Number of chicks when started	30	50	300	128
Number of chicks survived	30	35	285	117
Months to raise chicks for selling	30	3	36	19
Price per chick first chicks	30	1,200	4,000	1,603
Chicken house costs	30	25,000	800,000	530,167
Feeds Costs	30	90,000	961,000	465,667
Vaccination and drug costs	30	17,000	127,500	51,883
Other Costs	30	10,000	115,000	40,817
Total costs	30	295,000	2,199,000	1,302,733
Total costs less poultry house	30	270,000	1,599,000	773,233
Revenue chicken selling	30	420,000	3,400,000	1,373,667
Revenue eggs	30	0	1,344,000	139,433
Total Revenue	30	420,000	3,526,000	1,458,433
Gross Margins	30	(946,000)	1,641,000	299,300
Gross margin less poultry house	30	(14,000)	1,941,000	685,667
Re-invested amounts in poultry	30	70,000	750,000	373,867
Amount used to buy assets	30	0	600,000	104,667
Amount used to meet education expenses	30	0	1,550,000	202,000
Amount used to buy a plot	30	0	900,000	52,333
Amount used to construct/maintain a house	30	0	1,000,000	63,200
Amount used to meet health expenses	30	0	380,000	43,183
Number of times you eat meat before	30	1 per month	once per week	Once per week
How many times you eat meat/eggs per week?	30	2	7	3
Number of meal before	30	1	3	2
No of meal after	30	2	4	3

4.5.3 Standard poultry keeping costs and Gross Margins recommended by the veterinary officer

During the survey the consultants interviewed the Veterinary officer, Mr. Erasto Mbele who provided the standard costs and gross margins for poultry production. The values were computed for 100-200 chicks and are presented in Table 4.5b. The analysis was made by making assumptions that a keeper would purchase only the chicks' starta feeds at a price of TZS 65,000 from the distributor and the rest of feeds would buy from the local feed mixer/processors. Also the duration of keeping was only three months and a keeper targeted to sell all chickens once after three months. Moreover, the calculation was made by assuming that the chicken would be sold at TZS 10,000 each and the price of feeds would remain constant throughout the three months. The analysis shows that the keepers recover the costs of production after selling chickens in the second round. In the first round, because of incurring the fixed costs of poultry house and dishes; a keeper got a negative gross margin of TZS 57,892 while in the second and other rounds gross margin was approximately TZS 428,392. As we have explained in the previous sections, the gross margins depended on many factors such as assurance of selling a chick at a reasonable price and the keeper should maintain the quality of chickens while avoiding unnecessary keeping costs. The veterinary officer stressed that the costs of poultry house can be reduced since most of the building materials were found within keepers' locations especially for those keepers who live in rural areas.

Table 4.5b: Standard poultry keeping costs and Gross Margins from the veterinary officer

Variable (s)	**Amount in TZS**
Chicks purchase costs for 100 chicks@1,300 TZS	130,000
Chicks starta mash	65,000
9 bags of 50kg of Feeds bought from local processors/mixers @ 30,000 TZS	270,000
Vaccines and drugs	30,000
The poultry house costs	600,000
Transportation costs	10,000
Dishes, saw dusts, electricity costs	50,000
Total costs	**1,155,000**
Selling of 90 chicken@ 10,000 (Assumption 10 died or consumed by household)	900,000
Gross margin first round	**(255,000)**
Costs second round (1,155,000-600,000)	555,000
Revenue second round	900,000
Gross margins other rounds (900,000-555,000)	**345,000**

4.6 Impacts of Poultry Keeping

Impacts of poultry production have been analyzed in the following sections.

4.6.1 Impacts of Poultry keeping on education

The findings in Table 4.6 indicate that only 36.7% of the poultry keepers have realized the impacts of poultry keeping on education. The amount paid for education services displayed in table 4.6 depicts the higher amount paid for educational services than the same amount paid by veggies farmers. The results imply that poultry keepers realized more returns than veggie farmers

and hence paid for various services such as educational services. The poultry keepers confessed that, poultry keeping was worthy undertaking, since it helped them meeting the basic household's needs. The data show that the maximum amount paid for educational expenses was TZS 1,550,000 while the minimum amount was TZS 35,000. The data implies that the poultry keepers recognized the value of education for their children. The amount varied among keepers depending on purpose of payment. For example, those who paid fees in private school incurred higher costs than those who bought stationeries for their children who studied in the government schools where there was exemption of fees. During the FGD keepers stated that they preferred to send their children in the private schools because they believed that quality education was offered there. Two women Celine Chilongola (25 years old) and Mwanga Adam (35 years old) from Dumila village admitted:

"I like this poultry project because it helped me to send our children to private school here in Dumila. He is standard three now (Chilongola).

"The poultry keeping enabled me to meet the basic needs and I managed to send my children in a reputable private school. He is in form four now and another one is in standard five (Adam)."

Table 4.6: Amount used to pay the education expenses for Poultry keepers

Amount used for education TZS	Frequency	Percent
None (0)	19	63.3
35,000	2	6.7
90,000	1	3.3
150,000	1	3.3
540,000	1	3.3
600,000	1	3.3
900,000	1	3.3
960,000	1	3.3
1,000,000	1	3.3
1,550,000	1	3.3
Total	30	100.0

4.6.2 Impacts on Poultry keeping on house construction or maintenance

The maximum amount of money used for buying plot or houses' construction or maintenance was TZS 1,000,000 while the minimum amount was TZS 150,000. The findings from Table 4.6 indicate that only 13.3% of keepers used their income for house construction or maintenance. The data may imply that majority of the poultry keepers allocated the poultry income for other expenditures except the four keepers whose their information are provided in Table 4.6. The data further implies that poultry keeping could contribute to better houses through construction or maintenance.

Table 4.7: Amount of Poultry income for house construction or maintenance

Amount used	Frequency	Percent
0	26	86.7
150,000	1	3.3
300,000	1	3.3
446,000	1	3.3
1,000,000	1	3.3
Total	30	100.0

4.6.3 Impacts of poultry production on assets

Table 4.8 indicates the amount of income used for purchasing assets. The findings expose that only 26.7% of keepers used their income to purchase some assets and the amount used for purchase ranged from TZS 100,000 to 600,000. The value of asserts determined the pricing amount. Keepers confirmed to purchase assets such as buying home furniture's and utensils, motorcycles and bicycles after earning income from poultry where the maximum amount was TZ 600,000. Some of the purchased assets helped keepers to be effective in poultry keeping. For example, some keepers bought bicycle which helped them in transportation of the poultry feeds from the supply points to the keepers' premises.

Table 4.8: Amount of poultry income used to buy assets

Amount used to buy assets	Frequency	Percent
None (0)	22	73.3
100,000	1	3.3
200,000	1	3.3
320,000	1	3.3
420,000	1	3.3
500,000	3	10.0
600,000	1	3.3
Total	30	100.0

When keepers were asked, if the poultry production made their assets to increase, 30% of them said, Yes. Assets increase means purchase of new assets done after selling of chickens and eggs. Purchase of assets by keeper motivated new keepers to join the project after observing impacts from the preceding keepers. Table 4.9 gives information about assets increase of the poultry keepers.

Table 4.9: Assets increase due participation in poultry keeping

Response	Frequency	Percent
Yes	9	30.0
No	21	70.0
Total	30	100.0

4.6.4 Impacts of poultry production on health services

Results from Table 4.10 divulge that 50% of the poultry keepers used their income to pay for the health services. The findings indicate that poultry keeping was essential for maintaining the health of keepers. The data from Table 4.10 applauds that keeping poultry was worth since many farmers could meet the heath expenditures after earning income from selling chicken and eggs. The data illustrates that the amount used to pay for health services ranged from TZS 11,500 to TZS 380,000.

Table 4.10a: Amount paid for health services

Amount used for health services	Frequency	Percent
None (0)	15	50.0
11,500	1	3.3
20,000	1	3.3
21,000	1	3.3
23,000	1	3.3
25,000	1	3.3
30,000	2	6.7
50,000	2	6.7
70,000	1	3.3
92,000	1	3.3
95,000	1	3.3
198,000	1	3.3
200,000	1	3.3
380,000	1	3.3
Total	30	100.0

Health expenditures attained the maximum value of TZS 380,000. Health issues were sensitive and it is better that some poultry keepers used their income paying for health services. However, it not recommended for running the profitable poultry keeping, if a lot of funds would be used to cover the health charges because this might deplete the capital in anyhow. Table 4.6 shows that only 20% of poultry keepers had health insurance cover. The data indicates that majority of keepers were not covered by the health insurance services. This may disturb the poultry keeping if the health problem occurred when a keeper had only money for purchasing feeds. Obviously, a keeper would use the money for payment of health services instead of purchasing the poultry feeds and this might threaten proper management of the poultry which ultimately might have detrimental impact on the chickens quality and revenue. Therefore, this study calls upon NCA to stress on health insurance coverage for poultry keepers.

Table 4.10b: If have health insurance (Poultry keepers)

If have health insurance	Frequency	Percent
Yes	6	20.0
No	24	80.0
Total	30	100.0

4.7 Women empowerment caused by poultry keeping

4.7.1 Ms. Salma Miraji Poultry Keeping and Women Economic empowerment Case

The poultry production business robustly empowered women economically. That is to say it helped women to move from unreliable to reliable source of income. This was witnessed by Ms.

Salma Miraji from Kiyuing Darajani village in Hai district in her success story articulated in Figure 4.1.

Figure 4.1: Success story of Salma Miraji (42 years old)

My name is Salma Miraji, a group member from Darajani poultry keeping group found at Mijongweni village, in Hai district. I quarreled with my husband in 2016 which forced me to leave the house together with my 4 children namely, Ismail Fadhili (24 years), Abdallah Fadhili (18 years), Mwanahamisi Fadhili (15 years) and Najma Fadhili (9 years) and we went to my mother's house. Life was miserable without support from my ex husband. Therefore, I worked as a casual labour in rice, beans, maize and tomato fields for exchange of small amount of money which ranged from TZS 5000 to 7000 per day. The money paid was not enough to fulfill the daily basic needs and sometimes I requested the support from my elder son. Unexpectedly, I was told that in my village that there was a poultry production project and anyone is free to join it. I decided to join the project where NCA supported us initial chicks and constructed the poultry house for us on credit. From that point, I struggled to buy feeds and drugs and I managed to keep the chickens until they reached the time of selling. I have realized that the project is very good to me since I started; I have stopped working as a cheap labour in fields and I am able to eat three times a day. On top of that, I have managed to buy a plot for building my own house. I am glad that, my first son sends me approximately TZS 50,000 whenever I do not have money to buy feeds. Also my second son supports me by taking care of chickens, whenever I am not around.

Ms. Salma Miraji earned the total revenue of TZS 1,275,000 and a gross margin of 295,000 in 2019 but because she had not paid TZS 600,000 of the poultry house costs, she remained with TZS 895,000. Ms. Jona Chabaga and Pendo Samel from Dumila village were examples of other scenarios where the husband left the family and women provided the basic needs for the family through the support of poultry project.

4.7.2 Improved women confidence and daring spirit due to poultry keeping

The study commended the increase in confidence and daring spirits among women who kept poultry. For instance, it was revealed by Ms. Janeth Msindo a forty five years old woman in Dumila district: *"I have decided to join this poultry business after learning from my colleagues that the business is paying and I can keep three to four times in a year, so its return on investment is high.*"

4.7.3 Improved Value of woman in the household

The consultants revealed that the contribution of poultry production project to the value of women in the household. During the FGD women confirmed that they were empowered economically and the project made them to stand on their own feet in terms of supplying the

basic needs in the household, like buying some foods and purchasing the domestic needs without requesting money from their spouse which in turn reduced quarrels and misunderstandings.

4.8 Challenges that faced the poultry keepers in Hai and Kilosa districts

Poultry keepers both men and women are faced by some challenges that hindered their progress. These include:

Firstly, High costs of production due to increased price of maize and small fishes which were mixed with other ingredients to make the poultry feeds. During the survey the consultants revealed that the price of 100 kg maize bag was sold up to TZS 80,000 in July 2019 instead of previous price of TZS 40,000. Also consultants noted that there was no a reliable supply points for poultry chicks, feeds, vaccines and drugs in the production areas. This forced keepers to travel regularly to town just to buy these drugs and this increased the keeping costs.

The second challenge was improper poultry management that attracted pests and diseases for chickens. On top of that, some poultry keepers kept poultry half local. For example some keepers such as Rev. Graceford Mahingo did not have poultry houses but chicken slept in their living rooms. Also some keepers allow chickens to feed themselves and some fed them foods waste from restaurants.

Thirdly, low market price of chickens. Some poultry keepers reported to sell the chicken at a price of TZS 5,000-6,000 which sometimes was lower than the production costs per chicken; hence little or no profit. Furthermore, buyers had the notion that the chicken breeds were not suitable for consumption like the local chicken and this reduced the marketability of the local chickens. To prove, the existence of low price problem; After the survey two women keepers from Hai and Moshi rural district called the consultant to seek advices on where to sell their chickens. The consultants linked them with market specialist Mr. Oscar John who directed Ms. Anna Mbowe to communicate with buyers in Arusha city and when she did so, they told him that they were fed up. Also Ms. Lilian Kihewo communicated with consultant for the same problem. The consultant linked her with market specialist too. Keepers expressed that they were wavering to sell their chicken because buyers offered the price which could not recover the keeping costs. Both keepers demanded the price which was not less than TZS 15,000 per chicken and they complained that staying with chickens increased the keeping costs.

Fourthly, availability of chicks was a problem and the demand was higher than supply and when keepers ordered chicks waited for two to three weeks before delivery of chicks. Also keepers who ordered layers received many cocks. For example Anna Mbowe ordered 200 layers and she received only 50 layers; other chicks were cocks. The consultants found that layers were mostly demanded by keepers because they laid eggs up to two years consecutively.

Fifthly, failure of local trained feeds processors to meet the feeds' demand from poultry keepers. This jeopardized the project progression as the keepers were forced to buy feeds from other sources at high higher prices and hence they incurred the extra costs of transport of transportation.

The sixth challenge was low amount of capital for the poorest people. During the survey we interviewed about five people who were not joining the project. They asserted that poultry keeping required a lot of capital and hence they did not have such money. Women poultry

keepers stated that feeds were very expensive and it was difficult for them to buy when especially during the first round.
Lastly but not least was the challenge of low women control of money earned from selling chickens and eggs. During FGD women from Kilosa district complained that they did not have power to allocate income from poultry keeping for reinvestment or other expenditures. This scenario dwindle the poultry keeping morale for women.

4.9 Recommendations for improvement of poultry keeping
Basing on the above challenges the consultant recommends the following:

Firstly, efforts should be made to enhance the availability of affordable feeds; Poultry keepers should be trained on how they can use alternative to maize products as a source of carbohydrates in making the poultry feeds. They can use potato, cassava, millet etc so as to reduce the price of the poultry feeds. Also feeds should be prepared at one point in poultry keepers' localities to promote its availability. For example, in Hai Moshi district, because there was only one feed processor, when she was away in DSM for the health problems, keepers were forced to buy feeds for high prices. Keepers doubted about the quality of feeds since they bought from the buyers who were not amenable.

Second, the focus should be on the market availability. NCA should search for reliable markets for eggs and chickens. The veterinary officer should link the poultry keepers with the marketing officers. NCA should give loan to the poorest people to encourage them to participate in poultry production. The loan may be provided through IR VICOBA
Thirdly, NCA should employ more veterinary staff and or recruit the "para-veterinary staff" who can work and with the veterinary doctors. Also NCA should increase collaboration with government veterinary officer so as to serve more poultry keepers. It should be noted that poultry keeping is a risky activities especially when there are no reliable veterinary officer. Imagine if there is an outbreak of Newcastle disease and the veterinary officer is not there!

Continuous training on good poultry practices. More training should be conducted to poultry keepers to enable them to realize the potential of poultry keeping on poverty alleviation. As it was revealed by Mwanga Adam, a woman of 35 years old from Dumila village who said"
"The first challenge is that the project is new to me and hence I don't have adequate skills on poultry keeping. However, even if I have been trained on the good management of the poultry for one week; still I can't follow at once without the help from the expert. We women have a lot of things in our mind; therefore, we need training and assistance from the experts regularly".

5.0 THE PROJECT STAKEHOLDERS' ROLES AND BEST PROJECTS' DESIGNS, PRACTICES AND CRITERIA

5.1 Introduction

This chapter discusses various roles of projects stakeholders and it elucidates their influence on the success of veggie/fruits and poultry projects. The chapter also analyzes the key project's best practices and design criteria and scrutinizes the factors affecting the projects' adoption.

5.2 List of the NCA staff and partners who were interviewed

The consultants interviewed the categories of stakeholders so as to solicit various information on the roles they play to promote the NCA veggies and fruits production and poultry keeping. This was done in order to gather their roles, challenges and recommendations which could promote the effective implementation of the project activities. Table 5.1 indicates the partners and NCA staff who were interviewed.

Table 5.1a: NCA staff and partners who were interviewed

S/n	Name of staff	Areas served	Targets sat	Achieved targets up to July 2019
1	Rev. Dan Deuli-Partner- Morogoro-ACMD	Coordinator of all NCA part time staff and serves Kilosa District	1290 beneficiaries	Total 1,251 (women 951=76%), men 300=24% Youths =586 =47% Disabilities =0.1%=01
2	Rev Andrew Mushi-Partner- Moshi-ELCTND	Kilimanjaro, Arusha and Manyara regions-For Hai, Moshi rural and Babati districts	Veggie 1200 farmers Poultry keepers 250	Farmers>800 Poultry keepers>80 (men 30%, women 70%, youths 10%)
3	Kazi Ramadhani-Partner-BAKWATA-Bwawani-Bagamoyo	Bwawani	440 fruit cluster farmers	480 (female 80%, males 20% youths 10%)
4	Cathbert Mushi-Agronomist	Moshi town and rural, Rombo and Mwanga districts	440 farmers	173 farmers (Male-53% Female 47%, youths 14%, poorest 5%
5	Hussein Yusuph-Agronomist	Hai, Arumeru, Siha and Karatu districs	400 farmers	250 (30% males, 70% female, 10%, youths, with disabilities 2 farmers)
6	Christian Mrema-Agronomist	Chalinze, Bagamoyo	540 farmers	193 (female, 70%, male 30%)
7	Agness J.Mollel-Agronomist	Babati TC and RDC	400 farmers	240 (60% Female, 40% youths
8	Erasto J. Mbele-Veterinarian/ poultry specialist	Kilosa, Hai, Moshi rural, Kilolo, Mbozi	500-Kilosa 250 and Kilimanjaro 250	Kilosa 203 poultry keepers (Female 65%, male, 35%) Kilimanjaro 94(female, 67%, male, 33%)
9	Ocar John-Market specialist	13 working districts as listed above	72 groups for 13 districts per year	50 groups up to July 2019.

5.2.1 The role of the coordinating partner-Anglican Church Morogoro Diocese (ACMD)
Anglican Church Morogoro Dioceses did the following on behalf of NCA:

i. Act as NCA administrative manager for part time staff. As a HRM manager, ACMD was responsible for all HRM functions such as recruiting new staffs, paying the wages and other benefits, and conduct performance evaluation, transfer and termination of the job contracts.
ii. Procured, stored and distributed veggie irrigation kits to various areas in Tanzania
iii. Convened part time staff's meetings and advised NCA on all issues related to part time staff recruitment and management. The meeting was usually convened once after three months where evaluation of responsibilities' for every staff was made. The meeting sat also implementation targets for the part time staff. Moreover, the meeting recommended the areas for improvement for every part time staff

5.2.2 Payment package for part-time staff

The payment package for agronomist/veterinarian/market specialist is indicated in Table 5.1a

Table 5.1b: Payment package for part-time staff

S/no	Package item(s)	Value in TZS
1	Gross salary	1,500,000
2	Lead Agronomist	2,500,000
3	Health insurance charges 3%	75,0000
4	social security contributions 10%	150,0000
5	Travel and transport charges	500,000

The agronomist also was given a motorbike for field travel which was serviced by NCA

5.2.3 Is there value for money for the agronomist?
When the Coordinating partner was asked this question, he confirmed that, Yes, there was a value for money because decision on how much the agronomists and other part time staff should be paid, considered various dimensions such as the current labour market demand and supply and payment packages for other sectors. For example, Anglican Church Morogoro diocese paid staff with bachelor degree the gross monthly salary of not more than TZS 1,200,000. Therefore, ACMD had decided to pay the agronomists above the rate by considering the risk of short term employment. The consultants certify that there was value for money because agronomists perform many responsibilities and the rate was convenient for making them to meet the essential basic needs. Also since they have given targets to achieve, they were forced to work harder to reach their targets.

5.2.4 Role of the Evangelical Lutheran of Church Tanzania Northern Dioceses (ELCTND)
ELCTND had a target to reach 1200 veggies farmers and 250 poultry keepers.

The roles of Programme officer

i. To lead the agronomists who were under his supervisory mandate. These were Cathbert Moshi, Agness Mollel and Hussein Yusuph
ii. Writing the project proposals for soliciting funds from donors

iii. Organizing training for veggies farmers and poultry keepers. For example they had five days poultry training packages on construction of the chicken house, feeding, drugs and vaccines administration and marketing
iv. Linking farmers and poultry keepers with the service providers
v. Evaluate the progress of farmers and livestock keepers by using agronomists
vi. To lead VICOBA leaders, master trainers, paralegals and interfaith committee meeting

5.2.5 Role of BWAKATA Partner-Bwawani-Bagamoyo district

The roles of District Coordinator-Mr. Kazi Ramadhani

- Sensitize the fruits cluster members and non-members to join VICOBA groups
- To participate in PETs meeting
- To oversee and advise the 7 clusters
- To advise farmers on veggie and fruits production

5.2.6 Partners' challenges

- Low payment of BAKWATA partner in Bwawani and poor cooperation between him and his superior
- Poor cooperation between NCA partner in Kilimanjaro region with ward/district government agriculture and Livestock officer especially in Moshi rural and urban
- Poor communication between NCA partner in Kilimanjaro region and the agronomist, Mr. Cathbert
- Failure for government extension officer to use NCA as opportunity for promoting project's sustainability
- BAKWATA partner in Bwawani stated that the irrigation kits and other inputs were supplied far away from Morogoro town

5.2.7 Recommendations for consolidation of the partners' roles

- The NCA partners should strengthen the team work spirit with agronomists and other project partners. It was revealed that the communication/relationship between the NCA partner and agronomist in Moshi and BAKWATA partner and his supervisor in Bwawani Morogoro was not entertaining
- Rectify the incentives payment for the partners such as Mr. Kazi Ramadhani who complained that the amount of TZS 150,000 paid to him as incentives per month was not adequate because his work burden was heavy while he incurred much promotion costs than the amount paid to him
- NCA should establish drip irrigation kits and other inputs supply centre in Bwawani area

5.3 Roles, challenges and recommendations Agronomists/veterinarians

The leader for agronomists/veterinarians was Mr. PrayGod David. He advised and supervised the agronomists and veterinarians officers. He also acted as a Liasoning officer between the project partners, agronomists and NCA.

5.3.1 The Responsibilities of agronomists/veterinarians

The Roles of agronomists/veterinarians were:

- Visiting farmers, poultry keepers and agripreneurs and training them on proper vegetables and fruits production and poultry keeping
- Linking farmers and poultry keepers with agricultural inputs and feeds suppliers
- Advise the agripreneurs and feed processors on proper installation of irrigation kits or mixing of poultry feeds
- Veterinary officer advised the poultry houses' artisans on proper construction of the poultry houses
- Advise farmers on good agronomical practices and poultry keepers on the keeping practices which were market driven
- Recruit new veggie and fruits farmers and poultry keepers
- Linking farmers and poultry keepers with government agriculture and livestock officers at a village, ward and district level

Agronomists proposed that:

- There should be a petty cash which would be used for the emergence activities such as motorbike repair
- There should be an annual leave of 28 days per year as per Tanzania employment laws
- They should be given special motorbike riding wares
- TZS 500,000 for travelling allowance was inadequate especially when the agronomist/veterinarian officer travelled frequently in cities or towns and when the staff slept many days in cities.

5.3.2 Recommendations for improving the agronomists/Veterinary officers' role

- NCA to extend the contract duration for the part-time staff from three month to six month or one year
- NCA to supply the important working resources to agronomist and veterinary officer on time

5.4. The roles of Marketing officer

The project marketing activities were performed by Mr. Oscar John Italazyo who was stationed at Morogoro town and he served 13 districts which were Moshi, Arumeru, Chalinze, Babati, Kilolo, Mbozi, Songwe, Kasulu, Mbulu, Korogwe, Kilosa, Kiteto and Singida.

5.4.1 Marketing officer duties

- To link the veggie/fruits farmers and poultry keepers with the markets
- To collect the market information from buyers: large markets, individual buyers, hotels and disseminate these information to the project beneficiaries
- To present physically the veggie and fruits product to the potential buyers
- To establish the farmers/poultry keepers production clusters
- To search the specific buyers who buy veggies, fruits and poultry products on large quantities
- To train farmers and poultry keepers on marketing techniques and record keeping

The consultant noted the efforts made by the Marketing officer in strengthening markets for farmers such as promotion of collective marketing to facilitate the selling of veggie and fruits for

farmers and poultry keepers. He also linked Iringa fresh beans farmers with Eat fresh export company which bought the green beans from farmers. Farmers also had signed the contract with the company and they produced fresh beans according to the specifications provided by the buyer. In this arrangement farmers graded the fresh beans and sold the fresh beans rejects at Iringa municipal markets. He also linked the strawberry producers with Ronka Company which produce the yoghurt products in Arusha city.

5.4.2 Challenges faced by Marketing Officer

- Farmers had little knowledge on marketing techniques and it takes a long time to implement the marketing techniques
- There were some production areas which were not accessible by vehicle; hence it became difficult to produce large quantities of veggie, fruits or poultry products
- Some farmers did not have smart phones, hence it became difficult for them to access the market information
- Lack/inadequate promotion materials such as leaflets and posters

5.4.3 Recommendations for improving the marketing activities

- Farmers and poultry keepers should be trained in marketing technique because they some of them did not know where to sell their produces
- Value addition techniques for vegetables, fruits and poultry products should be established
- Supply seasons of other areas should known by farmers and poultry keepers to enable them to supply the products during scarcity in order to fetch good prices
- Production of veggie, fruits and poultry should align with market demands; There was a need to conduct research on demand

5.5 Old Daily Chicks producer

The consultants interviewed Mr. Sembuli Abdallah Togwa living in Magole Kilosa district. Mr. Togwa supplied chicks in Magole and Dumila villages in Kilosa district.

5.5.1 Old Daily Chicks production costs and Margins

Mr. Togwa had been issued a loan of two hatching machines by NCA at a subsidized price of TZS 1,200,000 but the real price was TZS 1,800,000. The two machines hatch 128 and 48 chicks respectively. The costs of hatching chicks are presented in Table 5.2. The table shows that, if only six chicks died during hatching, the gross margin was TZS 113,400. However, the margin would be higher if hatching would be done after each 21 days. If hatching was done at least 15 times per year, the producer could repay the loan very smoothly.

Table 5.2: Old Daily Chicks production costs and Margins

Item	Description	Costs
Eggs	500 per egg x 176 eggs	88,000,
Electricity charges	2 units x21 days x300 per units	12,600
Spirit	1 Pc	2,000
Vaccination	1 PC	5,000
Total Costs		107,600
Selling price	1,300x 170	221,000
Gross margins		113,400
Time to recover the loan	Approximate 1.5 years*	

*if half of the gross margin will be used to repay the loan

5.5.2 Day Old Chicks producer's Challenges

Mr. Togwa reported that for the first time he thatched 128 eggs but only 40 chicks were alive, 88 died due to lack of electricity for 12 hours. For the second time 62 eggs were dormant and for the third time 68 chicks died at the stage of hatching due to lack of electricity for six hours. Therefore, the challenge was lack of the generator which can supply electricity in 21 days, 12 hours in each day consecutively when the power was off. Also the availability of hatching eggs was another problem because hatching required special eggs which had been mated by the cock who possess the required breeding attributes. In order to curb this problem, Mr. Togwa intended to keep chickens that would hatch eggs, buy a generator and a machine which could hatch 500 chicks at a time. He confirmed that he had sold all the hatched chicks at a price of TZS 1,300 each. Mr. Togwa further stated that the demand of chicks was usually high from July to December because during the rainy season, keeping was not done by many keepers because of many poultry diseases prevailed. Mr. Togwa had been trained extensively by poultry experts from SUA.

5.5.3 Recommendations for NCA based on DOC producer's challenges

Mr. Togwa should be facilitated with capital in order to expand the poultry hatching activities and this would make him to serve many people in his or beyond localities and hence this would overcome the problem of chicks unavailability which was revealed during data collection.

5.6 The role of Silverlands chicks and feeds distributor-Morogoro branch

Silverlands was a company dedicated to hatch and sell chicks and poultry feeds almost in 20 regions in Tanzania. Arusha branch serves the poultry keepers of the Northern zone including Kilimanjaro region while Morogoro branch distribute day old chicks and poultry feeds in Morogoro region. At silverlands Morogoro branch the consultants interviewed Mr. Fidelis Peter Kavenuke (Sales Coordinator and Ms. Aneth Shallo (Store keeper/Sales Administrator).

5.6.1 DOC distribution arrangement by Silverland Morogoro region

The silverlands staff reported that production of feeds and hatching of chicks was done at Silverlands headquarter in Iringa region. Apart from selling chicks and feeds, Silverlands Morogoro region provided the advisory services for poultry keepers on issues related with day Old chicks production. They also provided a cheap transport service for feeds for a distance not exceeding 70 km from the centre. They however, transported the feeds in distant areas if there were 200 bags and more. Also they offered the agent price for a buyer who bought large number of chicks (1000 and more) and feeds (from 10 bags and more).

The agent price was given to registered keepers (also known as corporate customers) and the price was discounted by TZS 100 per chick while the price of feeds was reduced by TZS 3,000 per bag. The price of feeds for starta chicks, broiler growers and broiler finisher feeds were TZS 63,500, 59,500 and 57,000 respectively. Silverlands Morogoro region was however challenged by stiff competitions in feed business. The consultants revealed that demands of chicks during the survey was higher than supply. Silverlands had a system of handling the customers' complaints and compensated the poultry keepers when arose problems emanated from Silverlands Company. For example, in 2018 many sold chicks died due to lack of calcium in feeds and hence silverlands compensated the poultry keepers.

5.6.2 Recommendations to NCA for silverlands Morogoro

NCA poultry keepers should be registered as corporate customers so as to accrue the benefits of reduced chicks and feed prices.

5.7 The role of agripreneurs

Agripreneurs had the task of installing the irrigation kits to veggie and fruits framers and did the minor maintenance for the drip irrigation kits. The consultants interviewed two agripreneurs as presented in Table 5.3.

Table 5.3: Agripreneurs interviewed and their roles

Artisan name	Location/Village	Number of drips serviced per month	Amount paid per each drip (TZS)	Total amount earned per month
Mr. Dodo Matambo	Gedamar-Babati	50	7,000	200,000
Ms Kanaeli Mushi	Mkombozi-Hai	10	7,000	70,000

5.7.1 Costs analysis for drip installation

Costs of buying a drip irrigation facility was TZS 15,000 while the number of drip irrigation serviced per month for Dodo and Mushi were 50 and 10 respectively. The amount paid for the service for each drip facility was TZS 4,000 until May 2019 where it increased to TZS 7,000 after agripreneurs to complain that the amount paid for the work was not adequate to enable them to perform their works effectively. Mr. Dodo Matambo and Ms. Kanaeli Mushi stated that the amount paid for drip irrigation services enabled them to meet daily living expenses. Moreover, it helped them to expand the number of beds from 2 to 22 (8x1m) and from 1 to 10 for Kanaeli Moshi and Dodo Matambo respectively. It also helped them to boost the production activities, eating vegetables per week, increase the number of meals from one to three times, paying fees for their children and meet the health expenditures. However, because Dodo was an early adopter farmer, he engaged both with vegetables and fruits (pawpaw and banana) production and he also served some of his fellow farmers freely to encourage them to adopt the project.

5.7.2 Challenges agripreneurs face in their work

- Repeated (free of charge) servicing of the irrigation kits after fracture
- Lack of the transport facility- Sometimes Ms Kanael Mushi had to travel From Mkombozi to Lamungo and Uraa villages where she paid a bus fare of TZS 10,000 for return trip. However, this amount could be reduced if she could use her own motorbike and also could save time and make her to serve many farmers.
- Some beneficiaries perceived that TZS 15,000 per kit was very costly, they could prefer to pay the low costs, say only TZS 10,000
- Delay of payment for the service fee. It happened that agripreneurs has already serviced the irrigation kits but the payments for the service were delayed by farmers.

5.7.3 Recommendations for tackling agripreneurs' problem

- NCA to facilitate the availability of transport facility to enable the agripreneur to travel to distant areas
- To educate farmers on why the costs for irrigation kits was TZS 15,000
- Farmers to deposits money directly to the agripreneurs' account before the service

5.8 Poultry house artisans' roles

Two artisans from Kilosa district were interviewed. The details on the number of houses they constructed is indicated in Table 5.4

Table 5.4: Role played by the artisans

Artisan name	Location	Number of house constructed per month	Amount paid per each house (TZS)	Total amount earned per month
Deuji Bakari	Dumila Kilosa	10	150,000-200,000	1,500,000
Peter Chacha	Dumila Kilosa	15	150,0000-200,000	2,250,000

5.8.1 Poultry house' artisans cost analysis

The artisan charged the price of TZS 150,000 to 200,000 for a poultry house construction. The amount of the poultry house constructed depended on the number of artisans doing the collaborative work, their coverage and work demands. For example in June 2019, Mr. chacha with his assistant managed to construct 60 houses while Mr. Deuji constructed only 10 houses. Mr. Chacha and his assistant constructed many houses because they worked all over Tanzania while Mr. Deuji worked only in Kilosa district. The artisan work enabled them to eat the balanced diet food and met the health and educational expenses. For example Mr. Bakari paid at once TZS 50,000 as educational expenses for his child and bought a plot at a price of TZS 800,000. Mr. Chacha has also constructed a house worth TZS 2,700,000 and bought the artisan working tools for TZS 5,070,000. Apart from building the poultry houses, artisans also trained poultry keepers on how to repair the houses and frequently visited the livestock keepers to check if there were any improvements to be-made in the houses they had constructed.

5.8.2 Challenges of artisans

If the assistant artisans wrongly constructed the poultry houses, the artisans were obliged to re-construct using their own costs.

5.8.3 Recommendations related with artisans

The artisans should train their assistants before allowing them to construct the poultry houses to minimize the loss

5.9 The roles of Local Feed processors

The consultants interviewed the following feeds processors: Ms Anna Mbowe, Mr. Mike Ngowi and Georgina Chuwa and collected information from them regarding feeds processing costs and margins.

5.9.1 Local feeds processing costs and margins

Ms. Anna Mbowe at Kingereka A, Bomangombe in Hai district used TZS 36,000 to process feeds of 50 bag and she sold at TZS 45,000. She usually processed 5 bags per week and three bags used to feed her chickens while the two bags she sold to other poultry keepers. Mr. Mike Ngowi at Marangu in Moshi rural district produced feeds at costs of TZS 30,000 and sold at a price of TZS 35,000 per bag of 50kg. However, the price of maize grain rose to TZS 85,000 in July 2019 due maize scarcity which forced him to sells at the price of TZS 45,000 per bag instead of TZS 40,000 or 42,000 per bag he used to sell before. His production capacity was 15 bags of 50 kg per week. Ms Georgina Chuwa of Dumila Kilosa district produced one bag of 50 kg for a cost of TZS 33,325 and sold at TZS 38,000. Georgina had a capacity of producing 200kg (or 4 bags) per week). The consultants noted that the capacity of feed processors was low. However, they acknowledged that feeds making enabled them to pay the school fees for their children. For instance Ms Georgina Chuwa paid a school fee of more than 1 million for her children and she paid TZS 400,000 as electricity installation expenses for her house.

5.9.2 Challenges of feeds processors

Rising of the maize grain and small fishes' prices reduced the gross margins for feed processors. Also processors were had small feeds production capacity compared to demand. For example Mr. Michael Ngowi from Marangu asserted that his processing machine-was slow and hence was not efficient to produce enough feeds demanded by keepers. Furthermore, there were few processors and these made supply of feeds to stop when the feed processors got problems or when were away from their locations.

5.9.3 Recommendations for improving feeds supply

Feeds processors should be trained on feeds processing using the alternative carbohydrates feeds' sources such potato, cassava, millet etc so as to reduce the price of the poultry feeds, especially when the price of maize was high. The feeds' processors should be furnished with efficient machines which produce adequate feeds. NCA also should train adequate number of feed processors who would continuously produce feeds and should establish feeds' supply points within the keepers' location so as to reduce the costs of transportation of feeds from far places, especially when the feeds processors were unable to produce feeds.

5.10 The roles of Local and District Extension government officers

The government extension officers had the role of ensuring that the projects would be sustainable even after closure. The consultants interviewed the government extension officers to gather their awareness on the projects in their locations, project's impacts, level of cooperation between NCA and government extension officers and presence of conflicts which deterred the projects' implementation. The consultants interviewed village, ward and district extension officers as indicated in Table 5.5.

5.10.1 Government extension officers' projects awareness and the level of cooperation With NCA

All villages, wards and District Agricultural, Irrigation and Cooperative Officer (DAICO) except DAICO and District Livestock and Fishery Officers in Moshi rural and Siha district confirmed that they were aware on the existence of the project activities in their locations and they asserted and the cooperation between the NCA partners and staff was good. However, in

Siha district the coordinating government officer was the Community development officer instead of DAICO. Also in Moshi rural the Ward and district level officers were not aware on the presence of the NCA projects in their districts despite the DAICO Moshi rural was invited in one of NCA meetings but the objectives of the meetings was not explained thoroughly. Also the NCA partner in Moshi did not introduce the projects in the district officially neither submitted the implementation reports to government officers in Moshi district.

5.10.2 Extension officer's impacts realization of the project

The extension officers both at village, wards and district levels acknowledged the impacts of NCA projects in promoting the drip irrigation agriculture which used small amount of water and enabled production of the vegetables and fruits throughout the year and they proved that vegetables and fruits farming through drip irrigation has enhanced the increase of income, enabled the availability of nutritious foods and increased the number of meals. It also enhanced the availability of the extension services for farmers and livestock keepers in the locations where the project were implemented. They requested NCA to expand the coverage of the projects' activities in more villages and introduce other agricultural services such as green house farming and soil testing services. Also NCA should avoid duplication of efforts in areas with similar projects instead should collaborate with other projects with similar activities and agree on areas of operations for each project.

5.10.3 Recommendations for NCA to improve government extension services

NCA should use the participatory approach by ensuring that government partners are introduced to the project during project's introduction and implementation. Also NCA should design strategies which would encourage government staff to participate in the project activities without demanding payments. Moreover, they should strive to revamp the government extension officers' entrepreneurial skills which would help them to treat the existence of NCA project as opportunity for government extension officers to improve the extension services in their districts. This would ensure the project's sustainability. On top of that, NCA should establish the services recommended by the government extension officers such as green house farming and soil testing services.

Table 5.5: List of Government extension officers interviewed

S/no	Name	Title	Location
1	Ms Judith Manzi	Ward extension Officer	Gallapo –Babati
2	Ms Evelyn Kaaya	Village Extension Officer	Gallapo –Babati
3	Mr. Daniel Luther	DAICO	Babati Town Council
4	David Lekei	DAICO	Hai district council
5	Meshack Mkonda	Representative DAICO	Kilosa District council
6	Kadewele Mohamed	Village Extension Officer	Zombo-Kilosa
7	Chikira Peter Mcharo	DAICO	Moshi rural
8	Mr. Leonald Malisa	Acting District Livestock and Fisheries Officer	Moshi rural
9	Ms Sakina Mhando	Livestock Desk officer	Moshi Rural
10	Mr. Iddi Uledi	Livestock Field Assistant	Mabogini Ward-Moshi rural
11	Gucila China	District Youths Officer	Hai district

5.11 The roles of village leaders

The consultants interviewed the village leaders as indicated in Table 5.6.

5.11.1 Village leaders NCA's project impact realization

The village leaders confirmed that there was a positive impact brought by SHE projects in their locations They certified that veggies/fruits production and poultry keeping has promoted the increase of income to both farmers and poultry keepers and also made many villagers to learn on how to run vegetables/fruits farming and livestock keeping successfully. Furthermore, it facilitated the availability of vegetables, fruits and chickens in the project areas.

5.11.2 Challenges observed from the village leaders

The consultants observed the little cooperation between Bwawani village executive officer, Mr. Ramadhani Rashid and the partner Mr. Kazi Ramadhani. The village executive officer complained that he was not officially informed about the existence of the project activities in his village. However, after deep investigation, the consultants confirmed that, it was not true but the village executive officer wanted to provoke the project's partner before consultants. Moreover, Mr. Kazi presented to consultants the documents which indicated that the project was introduced to district, ward and village authorities and furthermore, there was a good cooperation between Mr. Kazi and other village officers.

5.11.2 Recommendations for working with government officers

NCA should design strategies or procedures which would enhance the official introduction of the projects to the Government authorities.

Table 5.6: Village government officers

s/no	Name	Title	Location
1	Mr. Mughusi Bilori	Village Chairman	Gedamar-Gallapo-Babati Rural
2	Mr. Habibu Tsii	Village Executive Officer	Gedamar-Gallapo-Babati Rural
3	Mr. Ramadhani Rashid	Village executive Officer	Bwawani –Morogoro
4	Mwanauru Kassim	Village executive Officer	Zombo-Kilosa

5.12 Dispensaries/health centres' responses

The consultants interviewed staff of this category in order to link the impacts of veggies production and poultry keeping with health status of villagers where the project was implemented. A nurse and midwifery, Ms Atupele Mwambije from Gedamar dispensary in Babati district was interviewed to link the presence of veggie farming and health status for villagers at Gedamar village. She reported that from June 2017 to June 2019 the malnutrition rate among children was reduced from 196 to 180 children. This was measured by number of children who showed the malnutrition symptoms. However, in Bwawani area, a Lab specialist who did not want to disclose his name because the consultants did not have appointment with him, reported that about 30% of pregnant women who came for blood check had blood inadequacy problem and the cases of patients who suffered from Malaria increased by 20% from January to July 2019 in Bwawani area. The data imply that there was an improvement of health status for children at Gedamar village and poor improvement of health status for fruits farmers at Bwawani area.

Recommendations: NCA should design programmes which would sensitize consumption of veggie, fruits, eggs and meat for farmers and poultry keepers to improve their health

5.13 IR VICOBA contribution on NCA project Activities

The consultants interviewed individual 32 IR VICOBA members who were also veggie farmers and poultry keepers to ascertain the contribution of VICOBA on implementation of the project activities. The consultants revealed that VICOBA have promoted adequately veggie and fruits production and poultry keeping activities. The study reveals that at least 93% of the project beneficiaries who were VICOBA members managed to pay their loans on time. The consultants noted that youths did not repay their loans on time because they migrated from one location to another to search for better lives.

5.14 Recommendations to VICOBA

- NCA should encourage VICOBA to promote projects' activities. The consultants found that about there were about 25% of project beneficiaries who were not members of VICOBA instead they complained that they did not have enough capital to operate the veggie, fruits and poultry projects. Also men and youths sensitization to join VICOBA especially in Coastal region because their numbers were not promising.
- NCA should collaborate with VICOBA to assist the poorest of the poor to participate in project activities. Also they can inject loans through VICOBA to promote the implementation or expansion of project activities. For NCA May injection funds in VICOBA to purchase the large volume water tank at Gedamar village to promote the veggie production and overcome the problems of water inadequacy.

5.15 Factors affecting adoption of NCA's projects

The study found that the factors affecting the adoption of veggie production /poultry keeping were:

5.15.1 Short duration of the project

Some veggie such as amaranth took 21 days and others from one months and beyond from time of seeds sowing and harvesting vegetables. Broiler chicks also were kept for minimum of three months. Therefore, short duration of the project attracted many beneficiaries to join the project.

5.15.2 Simplicity of the technology

The drip irrigation technology had no complication in such a way that new farmers could learn and adopt very fast. Also it saved time. Farmers argued that the technology was simple because, it did not demand supervision, as they opened the water for irrigation, at the same time they continued with other activities. Because the technology was simple**, b**y using the irrigation kits, a farmer could irrigate fruits or veggies twice a day. Drip irrigation also used small amounts of water, enhance quickly growth of vegetables, promote soil conservation and lead to income increase to farmers.

5.15.3 Inputs availability

The inputs applied in veggie were available around farmers' locations, making production of veggie simple. Inputs include seeds, fertilizers, fungicide, herbicides and insecticides.

5.15.4 Marketability of the veggies, poultry keepers

Despite sometimes the price was lower than expectations; farmers found buyers of veggies, fruits, eggs and chickens close to their proximities.

5. 15. 5 Use of effective communication strategy

Despite minor cases, at **e**very NCA implementation level, there was a clear communication channels. For examples, farmers had whatsapp groups for communication and the agronomists communicate directly to their leaders and whenever challenges rose were handled accordingly. Agronomists agreed that whenever they reported challenges to their leader, he handled them on time.

5.15.6 Low costs of the projects

The production costs for one bed of veggie was TZS 23,000. This amount was affordable for those who wished to invest in veggies production at initial investment stage. NCA also encouraged farmers to begin with initial investment before proceeding to next level investment.

5.16 Project key designs and practices criteria

The following were the observed key designs and practice criteria

5.16.1 Use of electronic data system

Electronic data system enabled NCA to track the data once a time. Also it discouraged manipulation of data because lower cadre staff could not access the data system.

5.16.2 Edibility of fruits/vegetables/poultry products

The first consumer of the livestock products was the farmer/poultry keeper himself. Both veggie/fruits and poultry keepers reported that they were the main consumers of the products they produced because they were assured about the quality of vegetables, fruits and poultry products; since they adhered to good agronomical and poultry keeping practices. It implies that they considered waiting time for veggie/fruits which had been sprayed insecticides and pesticides and chickens which had been administered drugs.

5. 16.3 Veggie/fruits farming and poultry keeping act as a source of employment

The NCA veggies production and poultry keeping were regarded as a source of employment for all categories of people (men, youths, women and people with disability). Due to unemployment problem, the study revealed that many people had been employed themselves from these production activities. The survey revealed that men, women, youths entrepreneurs, form four leavers and bachelor graduates had been employed on these activities.

5.16.4 Use of religious institutions as a strategy

Many people believed the religious institutions because they acted as a partisan for most people. Consultants can't ignore the fact that the religious leaders were amenable and whatever they talk was considered positively by the faith followers. Due to positive impacts of the previous projects, religious believers had expectations of benefiting from the current NCA project because they believe that the religious leaders cannot "cheat" them.

5.16.5 Small area of land for running the projects

Both poultry keeping and drip irrigation do not require large amount of land and they can be carried out within the residences of the project beneficiaries. This encourages many potential beneficiaries to join the project. It was noted that despite the land scarcity in Kilimanjaro region, the use of small piece of land has encouraged many beneficiaries to join the project.

5.16.6 Avoidance of religious prescription

NCA projects accepted members of any religion and encourages religious intermingle for all project beneficiaries. is a slogan which emphasizes people with diverse faiths to work together regardless of There their religious beliefs "*Dini mbalimbali, upendo na amani"*. The slogan might be interpreted *as "Various Religions, Peace and* L*ove"* This slogan is used a salute before beginning the group activities which involved members of diverse religions.

5. 16.7 Cooperation among religious leaders

NCA stressed the cooperation among people with different religious backgrounds. In order to strengthen the cooperation, there was interreligious committee in every project operating areas and this committee was represented by various religious leaders.

5.16.8 Use of VICOBA in promoting the economic activities

NCA used Interreligious VICOBA to promote the economic activities. Through VICOBA those who lacked capital, borrowed from VICOBA to run the veggie/fruits production and poultry keeping projects. This mode of operations promoted activity sustainability. Weekly meeting also promoted harmony and love among the VICOBA members.

5.16.9 Use of three months performance contracts

NCA issued three months performance contract for NCA part time staff. This mode activated the part time staff to work harder to achieve the targets sat. By using this mode, some staff had worked for more than two years and they managed to show the desired performances.

5.16.10 Focusing on the disadvantaged groups

NCA focused on benefiting women, youths and poorest of the poor. The analysis reveals that about 70% of the beneficiaries were women, were men and youths 30% and 2% were the poorest and people with disability. The analysis reveals that benefiting the poorest of the poor was a challenge. For instance, due to lack of inadequate capital Ms Rachel Urassa from Sanya juu used hare's urine, ashes and composite as alternative pesticides and hence practiced organic farming.

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study was done to assess the profitability and economic impact of Small holder's Empowerment (SHE) projects which included veggie, poultry and fruits to individuals, families and general. The survey was conducted in Kilosa, Hai, Moshi, Arumeru, Babati and Bagamoyo districts; Arusha city and Morogoro town from 11th to 24th July 2019. During the survey, 31 veggie farmers and 30 poultry keepers who had realized impacts and 23 and 6 veggies and poultry keepers who had not realized impacts respectively were interviewed. Moreover, 31 VICOBA members and 32 NCA partners, staff and government officials and 29 strawberry, cucumbers and tomatoes fruits cluster's farmers were interviewee using the Focus Group Discussion and in depth interview. The Specific objectives of the assessment were:

i. To analyze the cost structure for each investment type (veggie, fruits and poultry)
ii. To establish the payback period for each investment type
iii. To assess the rate of return for each investment type
iv. To determine evidence-based revenue streams and cash inflow per each investment type
v. To assess the net and gross profit margins
vi. Identify and document best practices and key design criteria and delivery model that increase or hinder project impact

Both quantitative and qualitative designs (specifically, concurrent mixed methods design type) in data collection and analysis was applied. Quantitative data were coded and entered into SPSS and excel sheets and then were analyzed. Qualitative data were analyzed using the contents analysis where qualitative variables were classified into themes and fields before analysis.

6.2 Conclusion

The conclusion is narrated based on the study's specific objectives as follows:

6.2.1 Cost structure for each each investment type (veggie, fruits and poultry)

The study reveals that veggies had different costs structures and except for tomatoes whose costs per bed, first round and per year was TZS 98,582, 1,505,350 and 2,933,350 respectively; the costs for other veggie (Chinese, *sukuma wiki, saro* (fig), amaranth, *Loshuu (*Ethiopian mustard), *Mnavu*- African nightshade, spinanch and swiss chard) per bed in the first round were TZS 31,996, 31,017, 31,782, 28,813, 29,712, 26,183, 29,775 and 30,800 while the total costs in the first round were 75,635, 57,623, 63,679, 55,975, 86,900, 45,500, 118,150 and 123,200 respectively. The data indicates that there was a little variation in the average costs per bed for veggie than tomatoes which was the capital intensive veggies. In average a farmer needed TZS 30,000 to operate one veggies' bed per season. The data also render that the total costs depended on the number of beds and the time used to maintain the bed which ranged between 21 days for amaranths and 4 to 6 months for the Swiss chard, spinach, *sukuma wiki* and Chinese.

In terms of fruits, cucumber required costs of TZS 36,475, 6,042, 6,042 and 9,475 in the first, second, third and fourth production round respectively while the strawberry required costs of TZS 1,049,988, 529,538 and 529,538 for year one, two and three respectively tomatoes produced in cluster expended the costs of TZS 109,170 and 40,911 for season one and two respectively. For poultry production, average the cost for 100 chicks in the first round was TZS 957,892 while

in the second round was 428,392. Total costs were less in the second round because an average fixed cost of TZS 529,500 was excluded in computations.

6.2.2 The payback period for each investment type

The payback period for each investment costs were as follows:

i. Veggies –One production round (3 months) except *mnavu*-in the second round (6 months)
ii. Strawberry-Six months (in a one year round)
iii. Cucumber fruits-3 months (in the first round)
iv. Tomato in cluster production -3 months (first round)
v. Poultry production – 6-months (in the second round)

6.2.3 Rate of return for each investment type

The rates of returns for each investment per year were as follows:

i. Veggie–Chinese 11 times of initial capital, *Sukuma wiki*- 6 times, Saro-8 times, Amaranth- 7 times, *Loshuu*-8 times, *Mnavu*-2 times, Tomatoes-12 times, spinach-5 times) and Swiss chard- 7 times
ii. Strawberry in cluster-3 times
iii. Cucumber fruits in cluster-92 times
iv. Tomato in cluster-10 times
v. Poultry production-2 times

6.2.4 Evidence-based revenue streams and cash inflow per each investment type

The following farmers and poultry keepers manifested evidence-based revenue streams and cash inflow per each investment type

a) Veggie

i. Chinese-Ms. Lightness Mushi from Roosinde village Hai who earned TZS 9,936,000 for 18 beds per year, followed by Mr. Dodo Matambo from Gedamar village Babati who earned TZS 4,320,000 per year with 10 beds
ii. *Sukuma wiki* - Mr. Dodo Matambo from Gedamar village Babati who earned TZS 2,592,000 for 6 beds per year
iii. *Saro* - Mr. Dodo Matambo from Gedamar village Babati who earned TZS 3,456,000 for 8 beds per year
iv. Amaranth- Ms. Lightness Mushi of Roosinde village in Hai district who earned TZS 835,200, for 3 beds per year
v. *Loshuu* -Ms. Lightness Mushi of Hai district who earned TZS 1,344,000 for 4 beds per year
vi. *Mnavu*- Ms Upendo Japhet from Ngombaru village –Siha in Hai district who earned TZS 252,000 for 3 beds per year
vii. Tomatoes- Ms Rose Timothy from Soweto Moshi town who earned 51,000,000 per year for 17 beds
viii. Spinach-Mr. Lwitesen Swai, from Modio village in Hai district who earned 1,260,000 per year for 4 beds

ix. Swiss chard-Ms Helen Mushi from Modio village in Hai district who earned TZS 1,536,000 per year for 4 beds

b) Strawberry -Ms Donna Mnali and individual farmers who earned a minimum of 6,000,0000 per year with 6 beds
c) Cucumber fruits-Bwawani cluster members who earned TZS 3,109,967 per member per bed per year
d) Tomato in cluster- Bwawani cluster members who earn TZS 1,560,000 per member per bed per year
e) Poultry production-Celina Kazimoto of Dumila who kept 500 in the fifth batch chicken and she approximately earned 4,700,000 in that round

6.2.5 Selling weeks for veggies, fruits and poultry products

Average selling weeks for Chinese, *sukuma wiki, saro,* amaranth, *loshuu, mnavu,* tomatoes, spinach and Swiss chard *were* 12,15,21,10, 14, 4, 10, 12 and 16 respectively. Cucumbers and strawberries were sold in duration of three months while strawberries' farmers earned income in the period of three years consecutively. Broilers and layers poultry keepers accrued income in average period of three and nine months respectively.

6.2.6 The net and gross profit margins

The net and gross profit margins per bed in the first season and per year are presented in Table 6.1.

Table 6.1: The net and gross profit margins

Project item (s)	Gross margin per bed first round-TZS	Gross margin per year-TZS
Chinese	69,837	739,169
Sukuma wiki	68,164	471,392
Saro	109,361	789,229
Amaranth (mchicha)	58,588	533,800
Loshuu- Ethiopian mustard	81,717	746,933
Mnavu- African nightshade	(6,300)	26,250
Tomatoes	905,964	32,472,000
Spinach	55,483	669,750
Swiss chard	75,600	907,200
Strawberry in cluster	1,110,012 (year 1)	1,630,462 (year 2)
Cucumber in cluster	755,525	785,958
Tomato in cluster	670,830	739,089
Poultry	(57,892)	856,784

6.2.7 Best practices and key design criteria

The following are the best practices and design criteria that increased the impacts:

i. Easy availability of inputs and extension services
ii. Marketability of the veggies, poultry products

iii. Use of effective communication strategy
iv. Low costs of the projects
v. Use of electronic data system
vi. Edibility of fruits/vegetables/poultry products
vii. veggies production and poultry keeping were used as a source of employment for all categories of people (men, youths, women, people with disability)
viii. Use of religious institutions as a strategy.
ix. Small area of land for running the projects and low costs of projects

6.2.8 Challenges affecting project implementations

The following major challenges were revealed:

i. Inadequate water availability for veggie projects in Babati district especially at Gedamar village
ii. High prices of feeds caused by high prices of maize and small fishes
iii. Inadequate feeds supply especially in keepers' locations
iv. Price fluctuations for veggies and poultry products
v. Inadequate number of veterinary staff and agronomists
vi. Operational problems emanated from agronomists, partners, agripreneurs, feeds processors, day chicks producers and government extension officers' responsibilities
vii. Inadequate knowledge on importance of health insurance services

6.2.9 Recommendations

i. NCA should facilitate the availability of water in Gedamar village at Babati rural district.
ii. Poultry keepers should be trained on how they can use alternative maize products as a source of carbohydrates in making the poultry feeds.
iii. Veggies and fruits farmers should be trained on applications of pesticides and fungicides
iv. Feeds should be prepared at one point in poultry keepers' localities to promote its availability.
v. NCA to search for reliable markets for, veggies, fruits, eggs and chickens.
vi. NCA to employ more veterinary staff and agronomists and recruit para-veterinary officer and collaborate with government veterinary officer so as to serve more poultry keepers and promote the project's sustainability.
vii. Solve specific responsibilities related from emanated from NCA part time staff, partners, agripreneurs, feeds processors, day chicks producers, poultry house artisans and government extension officers.

APPENDICES

APPENDIX 1: INTERVIEW CHECKLIST FOR NCA STAFF

Name of the Staff: _____Mobile Phone_____
Title of the staff:_____
Date of interview:_____

BEST PRACTICES AND DESIGN CRITERIA STRENGTHS AND WEAKNESSES

Best practice and design criteria	Strengths	Challenges
Involvement of diverse project partners-Use of religious actor as strategy		
Focusing on the demand driven community needs- eg livelihood improvement		
Use of simple and cheap technologies, which enhance the maximum use of available land		
Good payment package for agronomist/project partners		
Timely payment of agronomist/project partners		
Good facilitation packages for agronomist/project partner		
Use of digital data collection, performance and performance management tools		
Investment grouping/Macro investment and next level investment		
Emphasis on diversified income sources		
Effective communication procedures-Use of farmers whatsapp groups		
Testing of technology before scalability		
Encouraging participants to incur costs of technology instead of offering it free of charge		
Involvement of government officers		
Setting restrictions-For example none can be old chick producer and feed maker at the same time		
Any other factors (please list and explain)		

APPENDIX 2: QUESTIONAIRE FOR VEGETABLE AND FRUITS FARMERS

1. Name of producer_____Mobile no_____
2. Do you produce A: Vegetables……B. Fruits……. (Please Tick √)
3. Your gender. Male ( ) Female ( )
4. Your age.
   (A) 18-25 ( )
   (B) 26-35 ( )
   (C) 36- 45 ( )
   (D) 46-55 ( )
   (E) 56-59 ( )
5. Your education level.
   (A) Secondary school ( )
   (B) Diploma ( )
   (C) Degree ( )
   (D) Above degree ( )
5. Your marital status. Single ( ) Married ( )
6. Age:_____
7. Village:_____Ward_____District_____
8. Do you have any disability?_Yes_____No_____
9. When did you started vegetable/fruits production_____
Do you produce organically?_____ Yes_____No_____
10. Where do you sell your vegetables/fruits_____?
Do you have access to the far/international market?_____if yes, which ones?_____
Do you have buyers with special demands? Explain

11. Vegetable costs/margins

Type of vegetable/fruits(s)	Yield in good season per bed/plot (Tshs)	Number of beds/plots	Yield in poor seasons per bed/plot (Tshs)	Selling price Per unit (Tshs)	Cost items (Tshs)	Costs (Tshs)
1.					Seeds	
					Bed preparation	
					Herbicides and insecticides	
					Water charges	
					Harvesting /labour	
					Transport if any	
					Other charges (packaging, marketing costs etc)	
					Total costs	
					Market levies/tax	
					Gross margin	
					Net margin	

					Capital Payback period	
					Rate of return of investment	
					After what duration you earn income again? -Cash flow	
					Income earned per month	
					Income earned per year	
2.					Seeds	
					Bed preparation	
					Herbicides and insecticides	
					Water charges	
					Harvesting /labour	
					Transport if any	
					Other charges (packaging, marketing costs etc	
					Total costs	
					Market levies/tax	
					Gross margin	
					Net margin	
					Capital payback period	
					After what duration you earn income again? Cash flow	
					Income earned per month	
					Income earned per year	
					Rate of return of investment	
3					Seeds	
					Bed preparation	
					Herbicides and insecticides	
					Water charges	
					Harvesting /labour	
					Transport if any	
					Other charges (packaging, marketing costs etc	
					Total costs	
					Gross margin	
					Net margin	
					Market levies	
					Capital payback period	
					After what duration you earn income again? Cash flow	
					Income earned per month	
					Income earned per year	
					Rate of return of capital	

12. Impacts Variables

Please give the details how participation in project improved the following items

Item (s)	Before project	After the project
Other investments made as a result of primary investment please list them		
Increase of family annual income	TZS	TZS
Increase of crops Production (mention the type of the crop..... (kgs/acre)		
Do your assets increased? Yes or no		
Assets bought (list the type of assets)		
Improved of meal intake (the number and quality of meal)	Number of meals.....	Number of meals.....
Increase of nutrition status (how many times the family consume vegetables/meet/eggs per week?)		
Ability to meet health expenditures (improved/not improved)	Ability to meet health and education costs (Yes or No)…..	Ability to meet health and education costs (Yes or No)…..
Are you a beneficiaries of health insurance (Yes or No)		
Ability to meet education expenditures (Yes/No)		
Construction of a house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Maintenance/rehabilitation of house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Expand of business capital	capital.....(TZS)	capital .....(TZS)
Others (please specify)		

APPENDIX 3: FGD CHECKLIST FOR VEGETABLES AND FRUITS FARMERS

1. Do you produce A: Vegetables……B. Fruits……. (Please Tick √)
2. Type of the group A. Men……B. Women…..C. Youths… D. People with disabilities……(Please Tick √)
3. What vegetables/fruits do you normally grow in this area?
4. What are the Factors affecting adoption of vegetables/fruits production? Please tick √ and explain how
    i. Productivity-Good yield
    ii. Simple production technologies-No complications
    iii. Inputs/Seed availability
    iv. Disease resistance
    v. Marketability
    vi. Edibility
    vii. Fear of land fertility depletion
    viii. Capital (Affordability)
    ix. Extension services availability
5. What farming activities/practices which cannot be performed effectively by women/men/youth/people with disabilities?

Please list them and explain

6. What are the benefits of vegetables and fruits production?
7. What opportunities are there in this business? Processing/international marketing access/frequency demand etc
8. What are adoption challenges specifically for men/women/youths or people with disabilities? Please mention and explain them
9. What are your recommendations to improve the challenges?
10. Are there any negative impacts specifically for men/women/youths or people with disabilities?
11. Please explain

    Does Vegetables and fruits production cause any empowerment to women/people with disabilities? Yes____ or NO-------

    If yes explain, how

APPENDIX 4: QUESTIONNAIRE FOR POULTRY KEEPERS

1. Name of the poultry keeper_____Mobile no_____
2. Village:_____Ward_____District_____ ____
3. Your gender. Male ( ) Female ( )
4. Your age.
   18-35 ( )
   36- 45 ( )
   46-59 ( )
   Above 60

5. Your education level.
   None ( )
   Primary school ( )
   Secondary school ( )
   Certificate ( )
   Diploma ( )
   Degree ( )
6. Your marital status Single ( ) Married ( ) Divorced/separated ( ) widow/widower
8. Do you have any disability?_Yes_____No_____

9. When did you started poultry keeping?_____
10. Where do you sell your poultry products (eggs and chickens)_____?
Do you have accessed the far/international market?_____if yes, which ones?_____
Do you have buyers with special demands? Explain
11. Poultry keeping and selling costs items Table

Cost Item	Amount in Tshs
Investment costs	
Number of eggs/breeds bought	
Chicken house building costs	
Technology related costs	
Variable costs	
Improved chicken feed	
Better breeds buying costs	
vaccination and drugs	
Transport costs	
Total costs	
Selling price per chicken	
Total chickens	
Revenue Chicken	
Selling price per egg	

Number of eggs	
Total revenue	
Levies and tax	
Gross margin	
Net margin	
What is the capital payback period?	
What is the rate of return of capital?	
After what duration you earn money again? Cash flow	
Income earned per month	
Income earned per year	

12. Impacts Variables

Does participation on project activities made improvement of your livelihood? (Yes/No)

Please give the details how participation in project improved the following items

Item (s)	Before project	After the project
Other investments as a results of vegetables/fruits production/poultry keeping (mention)		
Increase of family annual income	TZS	TZS
Increase of crops Production (mention the type of the crop..... (kgs/acre)		
Do assets increased? Yes or no		
Assets bought (list the type of assets)		
Improved of meal intake (the number and quality of meal)	Number of meals.....	Number of meals.....
Increase of nutrition status (how many times the family consume vegetables/meet/eggs per week		
Ability to meet health expenditures (improved/not improved)	Ability to meet health and education costs (Yes or No)…..	Ability to meet health and education costs (Yes or No)…..
Are you a beneficiaries of health insurance (Yes or No)		
Ability to meet education expenditures		
Construction of a house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Expand of business capital	capital.....(TZS)	capital .....(TZS)

12. What challenges do you encounter?

13. What are your recommendations to overcome the challenges?

APPENDIX 5: FGD CHECKLIST FOR POLUTLY KEEPERS /MALE OR FEMALE

14. Category of the keeper A. Male…..2. Female……3. Youth…..(Please tick √)
15. Why did you decide to keep poultry?
16. What opportunities are there in this business?
17. . What are the strengths as men/women in facilitating or hindering poultry keeping adoption? (Please tick √ and explain)
    i. Productivity-weighed chickens/many eggs
    ii. Simplicity of technologies
    iii. chicks availability
    iv. Disease resistance
    v. Marketability
    vi. Capital availability
    vii. Extension services availability
18. What challenges do you encounter?
19. What are your recommendations to overcome the challenges?
20. Are there poultry keeping/practices which cannot be performed effectively for men/women/youths people with disabilities?
    Please list them
21. Are they specific adoption challenges specifically for men/women/youths/people with disabilities? Please mention them
22. How do the poultry help the surrounding communities/General impacts?
23. Does poultry keeping cause any empowerment to women/people with disabilities?

    Yes…… or NO……..
    If YES explain
24. Are there negative impacts of poultry keeping? Yes/NO

Please explain

25. Are there any negative impacts specifically for women or people with disabilities?
    If YES, Please list and explain in details

APPENDIX 6: CHECKLIST FOR SEED/FEEDS PROCESSORS AND DOC PRODUCERS/SUPPLIERS

1. Name_____Mobile Phone_____
Location:_____District:_____
Years in business:_____
How many people to you serve?_____
Where do you sell your products? feeds/chicks/seeds_____
What is your production capacity?_____
Are you able to satisfy the demand?_____

2. Cost items table

Cost Item	Amount in Tshs
Investment costs	
Costs of building store or poultry keeping house	
Variable costs	
Material buying costs	
Labour charges if any	
Transportation costs	
Other costs (please list)	
Total costs	
Selling price per piece/chick/kg	
Revenue per chick/kg	
Number of chicks/kg sold	
Total revenue	
Levies and tax	
Gross margin	
Net margin	
What is the capital payback period?	
What is the rate of return of capital?	
After what duration you earn income again? Cash flow	
Income earned per month	
Income earned per year	

3. What are the Factors are promoting Production? (Please tick √ and explain how)
   i. simplicity of technology
   ii. Marketability
   iii. Capital availability
   iv. Availability of a trainer/facilitator
4. What opportunities are there in this business?
5. What challenges do you encounter in the business?
6. What are your recommendations to improve the challenges?

7. Impacts Variables (For individuals)

Please give the details how participation in project improved the following items

Item (s)	Before project	After the project
Other investments resulted from primary investment		
Increase of family annual income	TZS	TZS
Increase of crops Production (mention the type of the crop..... (kgs/acre)		
Do assets increased? Yes or no		
Assets bought (list the type of assets)		
Improved of meal intake (the number and quality of meal)	Number of meals.....	Number of meals.....
Increase of nutrition status (how many times the family consume vegetables/meet/eggs per week		
Ability to meet health expenditures (improved/not improved)	Ability to meet health and education costs (Yes or No)…..	Ability to meet health and education costs (Yes or No)…..
Are you a beneficiaries of health insurance (Yes or No)		
Ability to meet education expenditures (Yes/No)		
Construction of a house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Maintenance/rehabilitation of house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Expand of business capital	capital.....(TZS)	capital .....(TZS)

Impact variables for the companies

What are the challenges you face when you sell your products to NCA partners/farmers/poultry keepers?

What do you recommend for overcoming the challenges?

APPENDIX 7: CHECKLIST FOR AGRIPRENEUR OR POULTRY HOUSES ARTISAN

1. Name: _____Mobile no:_____
2. Location: _____
3. Costs for making a drip irrigation facility/poultry house_____Tshs
4. Number of houses/drip irrigation facility per month_____
5. Selling price/amount paid for the work_____Tshs
6. The gross margin earned per house/irrigation facility_____Tshs
7. The gross margin earned per month/year_____
8. Impacts Variables (For individuals)

Please give the details how participation in project improved the following items

Item (s)	Before project	After the project
Other investments resulted from primary investment		
Increase of family annual income	TZS	TZS
Increase of crops Production (mention the type of the crop..... (kgs/acre)		
Do assets increased? Yes or no		
Assets bought (list the type of assets)		
Improved of meal intake (the number and quality of meal)	Number of meals.....	Number of meals.....
Increase of nutrition status (how many times the family consume vegetables/meet/eggs per week		
Ability to meet health expenditures (improved/not improved)	Ability to meet health and education costs (Yes or No)…..	Ability to meet health and education costs (Yes or No)…..
Are you a beneficiaries of health insurance (Yes or No)		
Ability to meet education expenditures (Yes/No)		
Construction of a house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Maintenance/rehabilitation of house	Yes or No... Amount used.....TZS	Yes or No..... Amount used.....TZS
Expand of business capital	capital.....(TZS)	capital .....(TZS)

9. Challenges you face in this activity

……

10. What are your recommendations for the mentioned challenges (if any)

……..

……
APPENDIX 8: CHECKLISTS FOR NCA'S PARTNER (ACDM AND ELCT)

1. Name: _____Mobile no:_____
Title:_____
2. Centre:_____
3. What are your roles in facilitating the NCA activities?
4. How many agronomists have you employed in the project area and their names?
5. What are the roles played by these agronomists?
6. What is the payment package for these agronomists-for **Anglican only**
   - Monthly gross salary_____ Tshs
   - Social security costs eg. NSSF_____Tshs
   - Gratuity_____Tshs
   - Other allowances (communication, fuel etc)_____Tshs
7. What is the value of total payment per month?_____Tshs
8. What date you pay monthly salary for agronomist?_____
9. How many clients/farmers/livestock keepers yo agronomist save per district?_____clients
10. What is the maximum number they are supposed to serve/recruit?_____clients

Is there value for money?

11. How you put emphasis on the following groups of people in your project design and implementation?
    i) Women_____(how many in your projects)
    ii) Youths_____(how many in your projects)
    iii) People with disabilities_____(how many in your projects)
12. What are the Factors affecting adoption for farmers/livestock keepers? (Please tick √ and explain how)

i. Productivity-Good yield
ii. Simplicity of technology
iii. Inputs/Seed availability
iv. Disease resistance
v. Marketability
vi. Edibility
vii. Fear of land fertility depletion
viii. Capital
ix. Extension services

26. Please explain the strengths and weaknesses on the following best practice and design criteria

BEST PRACTICES AND DESIGN CRITERIA STRENTHS AND WEAKNESSES

Best practice and design criteria	Strengths	Challenges
Involvement of diverse project partners-Use of religious actor as strategy		

Focusing on the demand driven community needs- eg livelihood improvement		
Use of simple and cheap technologies, which enhance the maximum use of available land		
good payment package for agronomist/project partners		
Timely payment of agronomist/project partners		
Good facilitation packages for agronomist/project partner		
Use of digital data collection, performance and performance management tools		
investment grouping/Macro investment and next level investment		
Emphasis on diversified income sources		
Effective communication procedures-Use of farmers whatsapp groups		
Testing of technology before scalability		
Encouraging participants to incur costs of technology instead of offering it free of charge		
Involvement of government officers		
Setting restrictions-For example none can be old chick producer and feed maker at the same time		
Any other factors (please list and explain)		

14. How you put emphasis on the following groups of people in your project design and implementation?

i) Women_____(how many in your project area)
ii) Youths_____(how many in your project area)
iii) People with disabilities (how many in your project area)

15. Challenges you face in your supervisory role?

……
…….
……
……..
……..

16. What are your recommendations for the mentioned challenges (if any)

……..
……
……

APPENDIX 9: CHECKLIST FOR THE AGRONOMIST/MARKET SPECIALIST

1. Name _____Mobile phone no:_____
2. District/station_____
3. What are the roles you play?
4. How far are you successfully in implementing your roles? Please explain
5. What is your payment package?
   - Monthly gross salary_____ Tshs
   - Social security costs eg. NSSF_____Tshs
   - Gratuity_____Tshs
   - Other allowances (communication/internet, fuel etc)_____Tshs
6. What is the value of total payment per month?_____Tshs
7. How many clients/farmers/livestock keepers you save per district?_____clients
8. What is the maximum number you are supposed to serve/recruit?_____clients
9. Number of women participating in vegetable / fruits/ poultry keeping_____
10. Number of youths participating in vegetable /fruits/poultry keeping/marketing_____
11. Number of men/women/youths/people with disability participating in vegetable/fruits /poultry keeping_____
12. Number of project participants below 1 USD (The poor people)_____
13. Please explain the strengths and weaknesses on the following best practice and design criteria

BEST PRACTICES AND DESIGN CRITERIA STRENTHS AND WEAKNESSES

Best practice and design criteria	Strengths	Challenges
Involvement of diverse project partners-Use of churches as strategy		
Focusing on the demand driven community needs-i.e livelihood improvement		
Use of simple and cheap technologies, maximum use of available land		
good payment package for agronomist/project partners		
Timely payment of agronomist/project partners		
Good facilitation packages for agronomist/project partner		
Use of electronic and immediate data reporting system-M& E tracking software		
investment grouping/Macro investment and next level investment		
Emphasis on diversified income sources		
Effective communication procedures-Use of farmers whatsapp groups		

Testing of technology before scalability		
Encouraging participants to incur costs of technology instead of offering it free of charge		
Involvement of government officers		
Setting restrictions-Example non performance of multiple activity by agri-preneurs and feed makers		
Any other factors (please list and explain)		

13. Explain the challenges you face during implementation of your day to day activity
14. What are your recommendations to overcome the mentioned challenges (if any)

APPENDIX 10: CHECKLIST FOR HEALTH CENTRE REPRESENTATIVES

1. Name of dispensary/health centre_____Mobile No:_____
Title _____
2. Are any nutrition related diseases reported by patients in this area?
……..
Can you list those diseases?
……
……
……
……
……
……
3. What is the percentage of patients who reported such problems?
…….
……..
4. How much number of children, men, women, youths and men being trained on nutritional issues in this area?
Men:_____
Women:_____
Youth:_____
School children_____
People with disabilities:_____
5. If yes (trained), on what matters/topics?
6. Do you have data on how many times the households consume vegetables and or fruits per week?
……
……
……
……
……
……..
7. Do you have data on what percents of people eat balanced diet foods per week?
……
……
……
……
8. What are you recommendations for improvement of nutritional problems to people in your area?
……
……
……

APPENDIX 11: CHECKLIST FOR VILLAGE OFFICER/COMMUNITY MEMBER

1. Name of the village officer/community member_____Mobile phone_____
Title/position_____
District:_____
2. What are the impacts of the project to the following groups of the community?
Community in general_____
Women:_____
Youth:_____
People with disabilities:_____
Children_____
3. What are your recommendations to promote the increased impacts of the project activities?
…….
……
……
……..

CHECKLIST 12: FOR DISTRICT/LOCAL GOVERNMENT EXTENSION OFFICER/VETERINARIANS

Name of the District/Local Government Extension Officer/Veterinarians_____ _____

Mobile phone…….Ward……..Division……..District…….

Are you aware of the NCA fruits/vegetables production/poultry production activities in your district/division/ward?

What are your roles in promoting the NCA activities in your district/division/ward?

What challenges do you face when promoting NCA activities?

What are your recommendations to overcome the challenges?

APPENDIX 15: LIST OF DOCUMENTS BEEN REVIEWED

1. NCA Country Strategy 2016 -2020
2. NCA Country Strategy 2020 -2024
3. Economic Empowerment Concept Development
4. Next Level Investments (NLIs) Document
5. Veggie Document
6. Terms of reference (TOR) for consultancy to assess the profitability and economic impact of smallholder empowerment (she) projects

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