END OF PROJECT REPORT

Project Name: **Drought Mitigation through Irrigation and Conservation Agriculture Extension – DICE II**
Country: **Malawi**
Agreement Number: **AID-OFDA-G-12-00190**
Reporting Period: **October 2012 – December 2014**
Contact Person:

Ms Camille Davis (CARE USA) with the Malawi DICE II project staff and the project beneficiaries (Adolescent Girls) in Salima, Malawi – February 2015

OVERVIEW

The Drought Mitigation through Irrigation Promotion and Conservation Agriculture Extension (DICE II) Project is a follow-on from DICE I, RIPE I & II projects that aim to mitigate the impact of drought and flooding and prevent crop failures in vulnerable communities on the south western lakeshore escarpment of Malawi (Salima, Dowa and Ntcheu Districts). The project strategy involves the promotion of small scale, sustainable and replicable irrigation systems and improved conservation agriculture practices: building economic resilience in vulnerable households through engagement in VS&L and provision of early warning support systems.

The project is also piloting the integration of adolescent girls into disaster risk reduction and preparedness planning. DICE II is supporting Malawi's progress in achieving the priorities set forth in the Hyogo Framework of Action 2005-2015 by reducing existing and future food security risks caused by natural hazards and climate change as well as strengthening the capacity of vulnerable communities to cope with current risks and adapt to new ones. The DICE II project targets 4,000 households reaching out to 22,000 individuals for a period of 31 months (September 2012 to March 2015).

This report is a presentation of the activities and related outputs achieved during the life of the project, that is, period from October 2012 to January 2015 and with a No Cost Extension to March 2015. The main activities planned for implementation during the life of the project were:

- Promotion of small-scale irrigation – activities included identification of irrigation schemes, formation and training of water user committees, irrigation scheme development (construction of water storage structures – weirs and canals) and promotion of winter cropping.
- Promotion of agro-forestry and water shade management – activities included training project beneficiaries in agro-forestry, horticulture, water shade management and promoting planting of trees including fruit trees.
- Promotion of conservation agriculture practices – activities included training project beneficiaries in conservation agriculture practices and promoting the use of these practices.
- Promotion of post harvest loss management – activities included training project beneficiaries in post harvest loss management and facilitating construction and use of modern mud smeared grain storage granaries.
- Promotion of Village Savings and Loans (VS&L) – activities included supporting existing VS&L groups or formation of new VS&L groups (in areas where there are none), identification and training of Village Agents (VA) in the VS&L methodology, training each of the VS&L groups in the VS&L methodology, and training of VAs in Economic Activity Selection Planning and Management (EASPM).
- Agribusiness skills development – activities included training project beneficiaries in basic agribusiness concepts and linking farmers to Farmer Business Schools.

- Piloting the integration of adolescent girls in disaster risk reduction and preparedness planning - activities included identification of adolescent girls and formation of adolescent girls groups, identification and training of IAG facilitators, training of adolescent girls groups and promoting the participation of adolescent girls in community based DRR activities.
- Disaster Risk Reduction – activities included training of Water User Committee (WUC) in preparing disaster preparedness plans and mitigating the effects of disasters, formation, training and linking of Village Civil Protection Committees (VCPCs) to Water User Committees, training of project participants in energy saving technologies and facilitating construction and use of energy efficient stoves.
- Capacity development through farmer-to-farmer learning – activities included conducting field days and study tours.
- Monitoring of agronomic practices for soya beans and groundnuts and introducing seed multiplication and seed bank systems

The qualitative highlights from the period October 2012 to March 2015 include: identification and development of 34 irrigation schemes; formation and training of 34 Water Users Committees (WUCs); facilitating irrigation of a total of 218.39 hectares; promotion of farmer to farmer learning through field days and study tours; promotion of irrigation farming activities where 42.36 hectares have been irrigated in all the three districts (Salima, Dowa and Ntcheu); facilitating construction of water storage structures (shallow wells and weirs) and canals in 21 irrigation schemes; formation of 32 new Village Savings and Loans (VS&L) groups; training of 22 village agents in Economic Activity Selection Planning and Management (EASPM); formation, training and linking of Village Civil Protection Committees (VCPCs) to Water User Committees; Integrating of Adolescence Girls (IAG) in Disaster Risks Management (960 adolescent girls); linking 203 marketing committee members from the 34 irrigation schemes to Farmer Business Schools and training them in collective marketing; training of 45 community facilitators in horticulture and agronomic practices; as well as supporting 3000 flood-affected households in Salima and Ntcheu through provision of cassava cuttings and sweet potato vines as part of early recovery.

MONITORING METHODOLOGY

The project used the following data collection methods during the period: VS&L Management Information System (MIS), review meetings, stakeholder meetings, focus group discussions, scorecard process (a participatory tool which was used for assessing, planning, and monitoring of services) and monthly reports on key project activities from field advisors which were validated by field visits and spot checks.

AGRICULTURE AND FOOD SECURITY

Objective: **Targeted vulnerable households have enhanced capacities to mitigate weather shocks and improve their food security**

Number of beneficiaries targeted during the reporting period: 22,000 individuals (4,000 households) for conservation agriculture, agro-forestry and water shade management *(11,000 individuals (2,000 households) for irrigation agriculture (sub-set of the above))*

Number of beneficiaries reached during the reporting period: 4,033 households[1] (2,454 female-headed; 1,579 male-headed) for conservation agriculture, agro-forestry, and water shade management*:*

- *12,507 individuals (2,274 households) for irrigation activities (sub-set of all of the above)*
- *16,500 individuals (3514 households: 2257 female-headed; 1257 male-headed) for emergency response*
- *1,116 individuals (203 households: 150 female-headed; 53 male-headed) for collective marketing*

Cumulative number of beneficiaries targeted to date: 4,000 households (22,000 individuals) for conservation agriculture, agro-forestry and water shade management *(2,000 households (11,000 individuals) for irrigation agriculture (sub-set of the above)) 3000 households for emergency response, and 203 households (150 female-headed; 53 male-headed) for collective marketing*

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Total numbers of beneficiaries targeted and reached to date: 4,033 households (2,454 female-headed; 1,579 male-headed) for conservation agriculture, agro-forestry, and water shade management *(2,274 households (12,507 individuals) for irrigation activities (sub-set of all of the above)) 3000 households for emergency response, and 203 households (150 female-headed; 53 male-headed) for collective marketing*

Project inception

The project conducted consultation meetings at district level in Salima, Dowa and Ntcheu targeting District Executive Committee (DEC) members. The aim of the consultation meetings was to express the project's ability to work in the area and seek DECs approval. The consultation meetings also provided a platform to establish other organizations working in the target areas in order to avoid duplication of efforts. After the DECs approval, the project conducted

[1] Based on the standard ratio of 5.5 individuals per household, 4,033 households is estimated to be 22,181 individual beneficiaries.

sensitization meetings at T/A level and GVH level with the aim of making the communities aware of DICE II project, its activities and soliciting their commitment.

A total of Six T/As (Kambwiri, Maganga, Pemba in Salima, Makwangwala, Ganya in Ntcheu and Chiwere in Dowa) and 26 GVHs (7 in Dowa, 10 in Salima and 9 in Ntcheu) were sensitized. A total of 11,939 people (4,851 men and 7,088 women) attended the sensitization meetings.

Activity 1 – *Promotion of Small Scale Irrigation*

Environmental and Social screening of potential irrigation schemes

The assessment involved physically traversing the irrigation command areas to establish the historical basis of the irrigation schemes. The following factors were considered during site assessment

- Water quality and quantity for irrigation
- Potential hectares for irrigation social economic viability
- Level of environmental damage as a result of irrigation activities and what corrective measures should be put in place to mitigate the potential damage
- The type of irrigation to be employed i.e. river diversion or shallow wells.

The assessment was done in collaboration with Total Land Care, district agriculture extension, irrigation and environmental departments. A total of sixty two (62) potential irrigation schemes were identified and assessed; and only thirty four (34) irrigation schemes qualified (13 in Salima, 13 in Ntcheu and 8 in Dowa districts) against a target of 30 irrigation schemes. The 34 irrigation schemes identified had 416 potential hectares for irrigation. The project exceeded its target of 30 irrigation schemes because water abstraction sources at T/A Kambwiri in Salima dried up due to low rainfall experienced during the 2012/13 rainy season, thereby rendering 4 irrigation schemes (Luso, Chiyangayanga, Chitsanzo and Mgwirizano) unable to cultivate crops using irrigation in the first year of project implementation. Table 1 below shows irrigation schemes by geographical area:

Table 1: DICE II Irrigation Schemes

District	Traditional Authority (T/A)	Number of irrigation schemes
Salima	Kambwiri	8
	Pemba	1
	Maganga	4
Ntcheu	Ganya	9
	Makwangwala	4

Dowa	Chiwere	8
	Total	**34**

Identification of beneficiaries

The project used irrigation schemes as entry points and also targeted female headed households and households with chronically ill people, orphans and vulnerable children. A total of 2,274 households (488 in Dowa, 683 in Salima and 1,103 in Ntcheu) are participating in irrigation activities translating to a total of 12,507 individuals benefiting from irrigation activities.

Land tenure meetings were conducted and conditions for land usage were determined in all the thirty four (34) irrigation schemes. Following the land tenure meetings, MOUs were developed and signed between land owners and irrigation land users and between Water User Committee and DICE II project. This was required because most irrigation farmers do not own land in the irrigation schemes and are compelled to borrow and or rent the land.

Supporting structures for sustainability

The project facilitated the formation of 34 Water User Committees (WUCs), one for each irrigation scheme, and the project also identified a total of 68 lead farmers (2 from each scheme), 34 community facilitators (1 from each scheme) and 68 irrigation technicians (2 from each scheme). All the WUCs, lead farmers and community facilitators have been trained in leadership and group dynamics and their roles and responsibilities including development of work plans, allocation of irrigation land to irrigation scheme members, water management, development of winter cropping plans, conflict management and facilitating the formulation and enforcement of irrigation scheme constitution. Irrigation technicians have been trained in construction of hydraulic structures, operation and maintenance of an irrigation scheme and leadership and group dynamics.

All the WUCs are functioning very well and are able to plan, execute work plans and mobilize local construction materials like sand and stones. The lead farmers and community facilitators are able to effectively deliver extension messages at community level. The irrigation technicians are ably supporting the construction of canals and water storage structures like shallow wells and weirs while the project provided technical support and monitored the construction work.

Training of staff and partners in Irrigation technology and Agronomy

The project conducted irrigation technology and agronomy training for 45 extension staff (33 men; 12 women), 10 from CARE Malawi, 5 from Total Land Care and 30 from the Government's Agriculture Extension and Irrigation

Departments. As a result of the training, a total of 2,274 (1,412 women, 862 men) project beneficiaries (which included WUC members from the 34 irrigation schemes, 34 community facilitators and 68 lead farmers) were trained in irrigation technologies and agronomy. Table 2 below indicates the number of people trained in irrigation technologies and agronomy by geographical area.

Table 2: Number of people trained in Irrigation Technologies and Agronomy

District	Traditional Authority (T/A)	Women	Men	Total
Salima	Kambwiri	283	112	395
	Pemba	56	5	61
	Maganga	188	39	227
Ntcheu	Ganya	460	389	849
	Makwangwala	130	124	254
Dowa	Chiwere	295	193	488
	Total	**1,412**	**862**	**2,274**

Irrigation scheme development

The project distributed construction materials in the form of cement, wheel barrows, shovels, builder's level, builder's trowel, PVC pipes, hoes, panga knives, tape measure, and hammers, while the project participants provided labour and local resources like sand and stones. Table 3 below shows the irrigation structures constructed per irrigation scheme.

Table 3: DICE II Irrigation Structures / Construction works per scheme

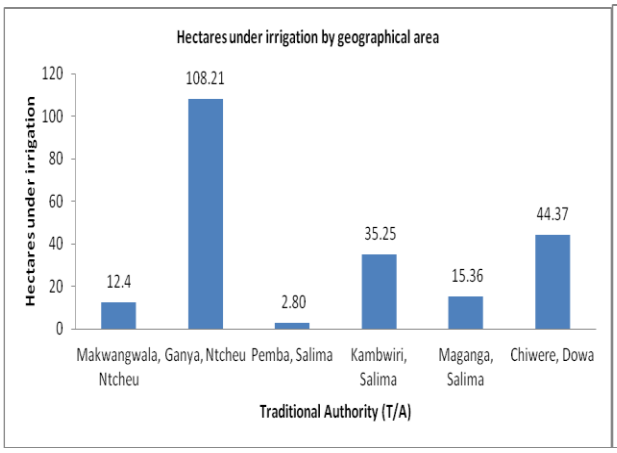
No.	District	Traditional Authority (T/A)	Group Village Headman (GVH)	Village	Name of irrigation scheme	Construction work done - Project Lifetime
1	Dowa	Chiwere	Matswana	Matswana	Madzidzi	Main canal construction (alignment) - 493 meters
2			Chidothi	Chidothi	Mwaiwathu	Weir maintenance
3			Namoni	Mbwatamila	Mkondodzi	Main canal construction (alignment) - 273 meters (39 meters is pipe crossover)
4			Zilase	Zilase	Chidzimbi	Main canal construction (alignment) - 239 meters
5				Sosola	Chikumba	Weir constructed, Pipe installation from weir to main canal - 6 meters
6			Nasungwi	Chimbalanga	Makawala	Main canal construction (alignment) - 275 meters, Pipe installation 18 meters
7			Makombe	Khombe	Kachimbwi	Weir constructed, Main canal construction (alignment) - 183 meters
8			Namoni	Khwisa	Khwisa	Weir constructed, Pipes installed from weir to main canal over a distance of 24 meters
9		Makwangwala	Mmemo	Mmemo 1	Nansale	Weir maintenance completed, Main canal construction (alignment) - 266 meters, Construction of 21 pillars and installation of pipes over a distance of 162 meters
10				Mmemo 2	Mikuyu	Main canal construction (alignment) - 220 meters, Pipe installation over a distance of 67 meters, Construction of supporting pillars - 19 pillars,
11				Odala	Ngoni	Main canal construction (alignment) - 310 meters, Pipe installation over a distance of 8 meters
12			Mkutumula	Mtalika	Mtalika	5 shallow wells constructed (aligned), 2 shallow wells excavated
13		Ganya	Mkumphira	Zalengera	Lowe	8 shallow wells constructed (aligned)
14			Chikadya	Chikadya	Bwanje	7 shallow wells constructed (aligned)
15			Sanjani	Kanyoza	Kanyoza	8 shallow wells constructed (aligned), 4 shallow wells excavated
16			Zande	Gwazanyoni	Tipindule	Main canal construction (alignment) - 274 meters
17			Masoalikuka	Masoalikuka	Nankhanu	Weir construction completed, Pipe installation from weir to main canal - 18 meters, Main canal construction (alignment) - 132.5 meters
18			Muwalo	Kamwaza	Kamwaza	Weir constructed, Pipe installation over a distance of 561 meters, Main canal constructed (aligned) - 80 meters, Construction of

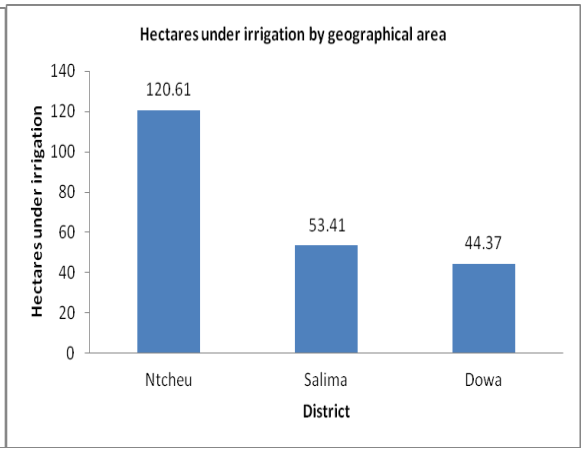
						supporting pillars - 29 pillars.
19			Muwalo	Chauluka	Chauluka	Weir maintenance completed, Main canal construction (alignment) - 601 meters
20			Khomba	Khomba	Khomba	Main canal construction (alignment) - 155 meters
21			Khomba	Kaziputa	Kaziputa	Weir maintenance completed, Old canal maintenance completed, Main canal construction (alignment) - 200 meters, Conveyance system - 5 pillars have been constructed to support pipes
22	Salima	Kambwiri	Mngolomi	Choma	Mtisunge	7 shallow wells constructed, Main canal construction (alignment) - 144.2
23			Liganga	Liganga	Liganga	3 shallow wells constructed (aligned), Main canal construction (alignment) - 158 meters
24			Chaseta	Chaseta	Chitsanzo	Main canal 121 meters
25			Chaseta	Chaseta	Luso	Weir maintenance work completed, Main canal constructed (aligned) - 101 meters
26			Chiyangayanga	Chaseta	Chiyangayanga	Main canal constructed (aligned) - 83 meters, construction of night storage reservoir completed.
27			Suzi	Suzi	Mgwirizano	Weir maintenance work completed, Pipe installation from last check dam to field - 48 meters, main canal rehabilitated - 54 meters
28			Kunthanga	Kunthanga	Mmbwemba	Main canal constructed (alignment) - 184 meters, 3.3 meters long by 1 meter wide dyke (damming structure) constructed.
29			Kachilele	Kaponda	Masoanyoza	Weir constructed, Main canal constructed (alignment) - 185 meters, Pipe installation from weir to main canal - 95 meters.
30		Pemba	Chindungwa	Chindungwa II	Chindungwa	3 main canals have been constructed (aligned) - total length is 333 meters, Pipe line excavation from intake to main canal - 69 meters
31		Maganga	Moyo	Moyo	Moyo	9 shallow wells constructed, Main canal construction (alignment) - 153 meters
`132			Moyo	Chidawi	Chidawi	4 shallow wells constructed (aligned), Main canal construction - 248 meters
33			Kunkhongo	Kunkhongo	Mkaika	8 shallow wells constructed (aligned)
34			Chimwavi	Sululu	Sululu	3 shallow wells constructed

Promotion of winter cropping

A total of 218.39 hectares have been utilised for irrigation during the project period (120.61 hectares in Ntcheu, 53.41 hectares in Salima and 44.37 hectares in Dowa) against a target of 160 hectares. Crops grown were maize, beans, cabbage, onions, mustard, sweet potatoes, beans, and okra.

An analysis of hectares under irrigation during the period indicates an increase in hectares planted with high value crops like tomatoes and onions, from 10 percent to 32 percent. Most of the high value crops are sold upon harvesting in order to generate income for the household. Figures 1 and 2 below indicate number of hectares put under irrigation by geographical area.





Figures 1 and 2: Number of Hectares under Irrigation by DICE II

According to the End of Project Evaluation (Annex A), conducted March 6-15, the maize harvested and the income realized from the sale of other crops during winter cropping helped communities extend their period of food self-sufficiency by 4 months, from 5 months of food self-sufficiency at baseline to 9 months.

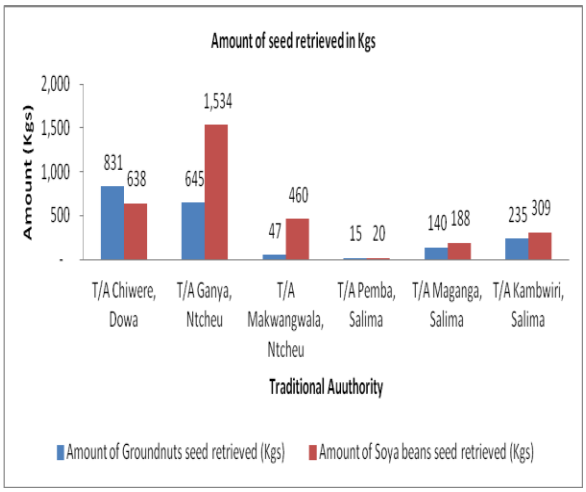
Seed systems and agricultural input in the irrigation schemes

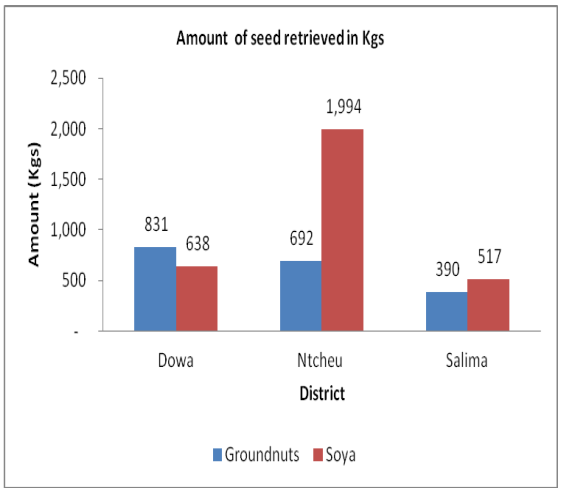
The aim of this activity was to address food production by increasing access to good quality seed by project participants, because good production starts with good quality seed. Smallholder farmers, who are project participants, do not have access to good quality seed. There are a number of reasons as to why they do not have good quality seeds, including but not limited-to:

- limited or no financial capacity to purchase
- unavailability of the good quality seed within their locality
- most seed companies favor crops whose seeds cannot be recycled like maize
- smallholder farmers lack information regarding availability of good quality seeds

The project addressed these problems by distributing improved seed. A total of 2,274 farmers (1,412 women; 862 men) received improved seed of maize, tomatoes, onion, cabbage, beans, okra and mustard as a start up seed for winter cropping, with a total of 10 tonnes of improved seed (5 tonnes of groundnuts and 5 tonnes of soya beans) going to a total of 1,738 project participants (1,032 women and 706 men) for rain fed cropping. Each farmer received a minimum of 2.5 kilograms and a maximum of 3 kilograms.

In order to ensure continued availability of improved seed among project participants the project facilitated retrieval of groundnuts and soya beans seed (see Figures 3 and 4 below) and this was distributed for planting during the 2013/14 rain cropping season for safe keeping at the irrigation scheme. The seed was re-distributed among project participants for planting in the 2014/15 rain-cropping season. A total of 1,912 kilograms of groundnuts seed (831 kilograms in Dowa, 692 kilograms in Ntcheu and 390 kilograms in Salima) and 3,149 kilograms of soya beans seed (638 kilograms in Dowa, 1,994 kilograms in Ntcheu and 517 kilograms in Salima) was retrieved during the period.





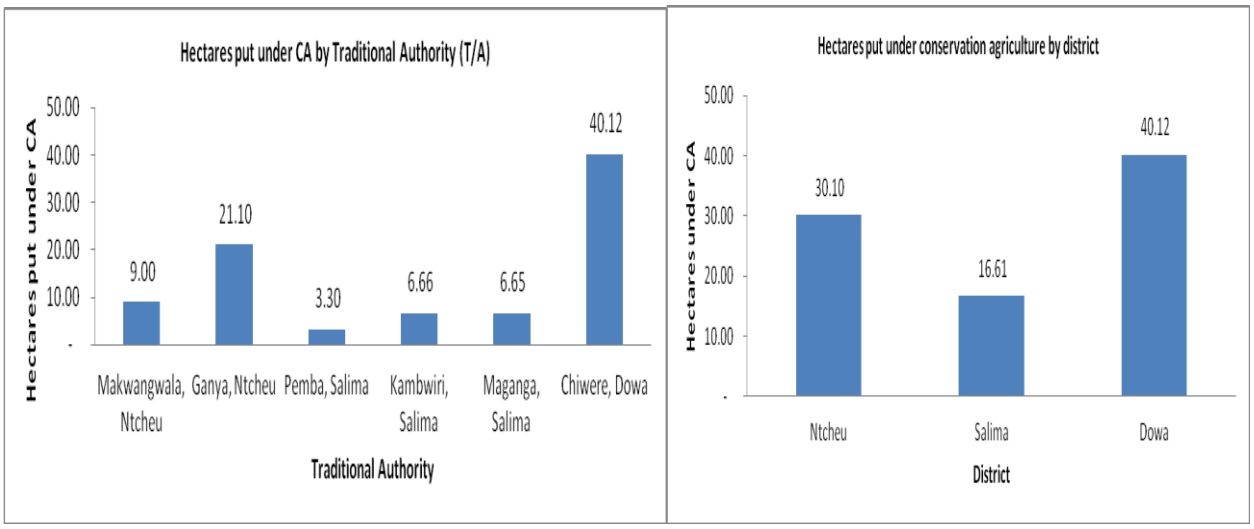
Figures 3 and 4: amount of Seed Retrieved through DICE II per Geographical area

Activity 2 – *Promotion of Conservation Agriculture practices*

The DICE II project identified the following practices as the main thrusts for conservation agriculture: minimum tillage, maximum soil cover and intercropping. These practices were promoted by the project.

A series of conservation agriculture trainings were conducted targeting extension staff and beneficiaries. A total of 43 extension staff (17 women; 26 men), 9 from CARE Malawi, 3 from Total Land Care and 31 from Government's Irrigation and Agriculture Extension departments, were trained as trainers. As a result of the extension staff training, 4,033 farmers (2,454 women, 1579 men) which included 68 lead farmers (21 women; 47 men), 34 community facilitators (7 women; 27 men) and members from the 34 WUCs were trained in conservation agriculture practices.

The lead farmers and community facilitators are able to impart conservation agriculture knowledge to other farmers. A total of 86.83 hectares (40.12 hectares in Dowa, 30.1 hectares in Ntcheu and 16.61 hectares in Salima) shifted from utilizing traditional agricultural techniques to fully implementing conservation agriculture techniques. Figures 5 and 6 below indicate the hectares put under conservation agriculture by geographical area.



Figures 5 and 6: Hectares under Conservation Agriculture under DICE II

The project mounted conservation agriculture demonstrations in order to impart knowledge and skills to farmers on the three pillars of conservation agriculture (maximum soil cover, minimum tillage and crop rotation). A total of 166 on-farm demonstrations were mounted during the period.

Activity 3 – *Promotion of Agro forestry and Watershed Management*

The project identified the following agro forestry and watershed management practices/technologies for promotion: the raising of tree seedlings and fruit trees and the growing of natural trees using truncheons. The truncheon system involves growing trees using tree branches, which is less labour intensive (since it requires no watering) and has a high survival rate.

After assessing the communities and the capability of the staff to promote the identified practices, knowledge gaps were identified. As such, the project organized agro-forestry and water shade management and horticulture training for extension staff with the aim of training them in nursery establishment and management; transplanting; tree seedlings management; fruit tree management and practices (e.g. banana and mango trees management); and planting of trees using the truncheon system.

A total of 45 extension staff (20 women and 25 men) were trained in agro forestry and water shade management, while 45 community facilitators (31 men and 14 women) were trained in horticulture practices. Of the 45 extension staff, 11 were from CARE Malawi, 3 were from Total Land Care and 31 were from Government's irrigation and agriculture extension departments. The training was conducted in two sessions; the first focused on tree planting using tree seedlings, and the second on tree planting using truncheons, management of fruit trees, disease control and grafting practices. Each session allocated time for practical training experience.

As a result of the trainings, the extension staff trained 4,033 farmers (2,454 women; 1,579 men) which included members from the 34 water user committees, 68 lead farmers and 34 community facilitators. In turn, the community facilitators will continue to train farmers and extend the knowledge gained to ensure sustainability of the practices that were promoted by the project to their communities.

The project distributed agro-forestry seeds: Senna siamea, Senna Spectabilis, Fadebia abida, and Accacius polycantha with polythene tubes, Mango fruit trees, Tommy Atkins and Kent as well as Banana suckers, and Dwarf Cavendish (Kabuthu). Establishment of tree nurseries was done in all the 34 irrigation schemes. A total of 54,468 tree seedlings and 10,269 truncheon trees were planted in the first year, while 10,400 mango fruits and 10,200 banana suckers were planted in the second year in all 34 irrigation schemes. Thirty four (34) new agro-forestry tree nurseries have been established in all 34 irrigation schemes this year. Table 4 below shows the number of trees planted.

Table 4: Number of Trees planted under DICE II

District	Traditional Authority (T/A)	No.: of tree seedlings planted	No.: of truncheon trees planted
Salima	Kambwiri	6,254	5,115
	Pemba	1,556	439
	Maganga	12,812	273
Total for Salima district		20,622	5,827
Ntcheu	Ganya	16,556	1,472
	Makwangwala	7,239	1,145
Total for Ntcheu district		23,795	2,617
Dowa	Chiwere	10,051	1,825
Total for Dowa district		10,051	1,825
Total for DICE II project		**54,468**	**10,269**

Activity 4 – *Promotion of Post Harvest Loss Management practices*

Reports by World Bank and Food Agriculture Organisation (FAO) indicate that 40% of the total harvest by small holder farmers worldwide is lost through post harvest management operations. This is no exception for Malawi. The project took post harvest management as one of the key areas to be implemented. The implementation modality was based on previous experiences from other projects within CARE Malawi. The previous projects identified several areas to be considered in post harvest management ranging from storage structure to human behaviour (eating habits).

With the help from government agriculture research station (Chitedze) a particular storage structure was identified and promoted. This is called a mud smeared grain storage granary. This is a simple structure that uses locally available materials involving improvements on rodent guard, smearing mud in and outside the granary, and mounting on a platform of 1.2 meters above the ground.

The project organized post harvest loss management training for extension staff, targeting a total of 45 extension staff (10 women; 35 men), 11 from CARE Malawi, 3 from Total Land Care and 31 from Government's Irrigation and Agriculture Extension departments. As a result of the trainings a total of 4,375 beneficiaries (2,675 women; 1,700 men)—which included 68 Lead Farmers (21 women; 47 men), 34 Community Facilitators (7 women; 27 men), and members of the WUC from the 34 irrigation schemes—have been trained in post harvest loss management practices. A total of 1,878 granaries have been constructed during the period and are in use.

Activity 5 – *Integration of Adolescent Girls (IAG) into Disaster Risk Reduction and Preparedness Planning*

Research and assessments have shown that when there are disasters girls and women suffer most. For instance, when there is drought, girls are forced into early marriages, drop out of school and indulge in risky behaviors like prostitution, which puts them at risk of sexually transmitted diseases and HIV/AIDS. As such, it was necessary that the adolescent girls be integrated into the project activities on a pilot basis.

The project conducted a design workshop for IAG which was facilitated by Kylah Biggs from North Western University in South Africa and was attended by 16 members of staff (4 women; 12 men), 14 from CARE Malawi and 2 from Total Land Care. Thereafter, orientation training for 18 extension staff (5 female; 13 male) was conducted.

The project formed two pilot adolescent girls groups of 20 girls each in Salima and Ntcheu districts. Past experience has shown that women and girls are more vulnerable to shocks and disasters, such as floods and drought, than men and boys. Therefore, if equipped with proper information about climate change and given a platform, adolescent girls may be better able to play leadership roles in society as they get older, enabling them to better protect themselves in times of disasters. Participation in the DRR process facilitates adolescent girls understanding the hazards around

them, providing opportunity for inclusion in action plans that incorporate the needs of women and girls. This was achieved through capacity building, which covered topics such as leadership and group dynamics, community participation and involvement, effective communication, team building and decision making, environmental awareness, disaster risk assessment, mental health and coping strategies, personal safety and self-defense, body personal hygiene, physical health, self-esteem, understanding relationships and love, self confidence, assertiveness and career guidance, gender and child rights, sexual health, first aid, and fire safety. The trainings were facilitated by experts from the following partner departments and organizations: Department of Health; Department of Gender, Children, Disability and Social Welfare; Department of Climate Change and Environmental Management; Department of Education; Department of Youth; Department of Forestry; and Youth Net and Counseling (YONECO; a local NGO).

The project concluded IAG trainings for the two pilot IAG groups by hosting a community event. The event was designed to convey targeted information that the girls had learned about climate change mitigation and adaptation, disaster risk assessment and nutrition. The adolescent girls presented to the community through songs, drama and poems.

The project held an IAG review workshop to review the strategy for integrating adolescent girls in DRR. The meeting was attended by 38 people (12 women, 26 men) from CARE Malawi, Total Land Care and the Government Departments that were directly involved in the implementation of IAG in the two pilot groups. During the review meeting it was discovered through interviews conducted with beneficiaries that there was a positive change in attitudes and behavior among adolescent girls participating in IAG. Some of the examples of the positive changes noted were that the adolescent girls were no longer coming home at night, they stopped attending nocturnal social gatherings, and the girls became more helpful with household chores. In addition, two of the adolescent girls from Ntcheu who had dropped out of school re-enrolled *(case study: Tabalire Henderson, Ntcheu)*. The workshop agreed to scale up the initiative and also looked into strategies on how best the project can engage men and boys as a way of minimizing the vulnerability of the target group.

Following this review, an additional 30 adolescent girls groups (12 in Ntcheu, 7 in Dowa and 11 in Salima) were engaged in the IAG strategy, amounting to a membership of 920. In total, the project has worked with 32 adolescent girls groups (13 in Ntcheu, 7 in Dowa and 12 in Salima) and has reached 960 adolescent girls. These girls have been trained and are participating in the raising of tree seedlings as a community based Disaster Risk Reduction activity. Table 5 below indicates the number of adolescent girls reached by the project by geographical area.

Table 5: DICE II IAG members (figures)

District	Traditional Authority (T/A)	No.: of adolescent girls reached
Salima	Kambwiri	190
	Pemba	24
	Maganga	70
Total number of girls reached - Salima		284
Ntcheu	Ganya	314
	Makwangwala	128
Total number of girls reached - Ntcheu		442
Dowa	Chiwere	234
Total number of girls reached - Dowa		234
Total number of girls reached by DICE II project		**960**

Activity 6 – *Agribusiness skills development*

The project conducted agribusiness training for 45 extension staff (12 women; 33 men), 10 from CARE Malawi, 3 from Total Land Care and 32 from Government's Agriculture Extension and Irrigation department. The project also conducted collective marketing skills trainings and linked the marketing committees to Farmers Field Business Schools (FFBS) in Dowa, Ntcheu and Salima, where a total of 203 households (150 female-headed; 53 male-headed) were trained in collective marketing.

A total of 971 irrigation farmers (646 women; 325 men) from three districts of Dowa, Ntcheu and Salima have been trained in basic agri-business concepts. This training focused on marketing as a means to promote commercialization of agriculture and increasing household incomes, especially for the smallholder farmers. Table 6 below shows number of people trained and marketing committees linked by geographical area.

Table 6: Number of people receiving agribusiness and collective marketing skills trainings, by geographical area

District	Traditional Authority (T/A)	Number of farmers trained			Number of marketing committees linked to FFBS		
		Women	Men	Total	Women	Men	Total
Salima	Kambwiri	155	85	240	12	9	21
	Pemba	23	7	30	12	9	21
	Maganga	83	37	120	12	11	23
Total for Salima		261	129	390	36	19	65
Ntcheu	Ganya	197	94	291	25	26	51
	Makwangwala	73	37	110	24	25	49
Total for Ntcheu		270	131	401	49	51	100
Dowa	Chiwere	115	65	180	14	21	35
Total for Dowa		115	65	180	14	21	35

Total for DICE II project	**646**	**325**	**971**	**150**	**53**	**203**

The trainings were organized with the following objectives:

- Enhance knowledge of the farmers on marketing and change their mindset towards market-oriented production and increase volume of their produce.
- Analyze problems and opportunities for better market solutions.
- Assess different types of services available for the farmers (linkages with the buyers, contract farming, inputs, market structure, market information, micro finance)
- Encourage cross fertilization of ideas among participants through marketing problem solving group discussions
- Develop and upgrade skills of marketing committees in agriculture collective marketing.
- Empower all participants with skills in collective agro-enterprise business planning
- Encourage cross fertilization of ideas among participants through marketing problem solving group discussions

The trainings focused on the following: farmer's organization; product identification and gross margin analysis; market research and analysis; development of agri-business plan; marketing record keeping; quality control mechanisms; sustainable production; and natural resource management skills. Natural resource management skills involve assisting farmers to develop the skills for simple mapping of the landscape that matters for their farming and helping them to maintain an inventory of its natural resources; assisting farmer groups to develop the skills for understanding how changes in the way natural resources are managed can affect various interest groups inside and outside their communities; and linking resource management to agro-enterprise development as well as linking farmers to Farm Field Business School.

Activity 7 – *Climate change, DRR, Early Warning Systems and Preparedness planning and Response*

Of recent, Malawi has been experiencing significant variations in weather patterns, ranging from severe drought conditions to extreme flood events. These extreme variations seriously affect agricultural production and development, since the output from new technologies and innovations that may raise productivity and profitability varies markedly with rainfall availability. Furthermore, because most rural people depend on agriculture for subsistence, unreliability of rainfall causes losses in incomes and increased general vulnerability to food insecurity.

Establishment and training of Village Civil Protection Committees

In the course of implementation the project realized that there were weak or no Village Civil Protection Committees (VCPCs) in the programmatic areas but rather these areas were using Village Development Committees (VDCs) to perform the duties of the civil protection committees, including hazard analysis, planning and monitoring of disaster activities, and reporting. This however posed challenges in that most VDCs have limited knowledge about the duties of VCPCs and that limited time is allocated for disaster risk reduction work.

In light of this realization, the project supported the government in establishing, revamping and training VCPCs in Salima, Dowa and Ntcheu districts. The main objective of the training was to establish practical linkages with the government's early warning system program and integrate Water User Committees into the VCPCs. A total of 32 VCPCs (6 in Dowa, 7 in Salima and 9 in Ntcheu) were established, revamped and trained by the District Civil Protection Committee, representing a total of 320 members of the VCPs (193 women; 127 men) that were trained. Representatives from irrigation schemes in these areas participated in the trainings. Each VCPC developed a preparedness and response plan. In addition, communication links were developed between the VCPCs, WUCs and government.

Community-based energy saving technology trainings

While loss of tree cover is a major cause of climate change in Malawi, 90 percent of Malawi's population depends on wood fuel for their energy needs. The growing demand for wood fuel is the major causes of deforestation in Malawi's dry lands. In order to address deforestation in its impact areas, the project organized an energy saving technology training for DICE II project staff where 9 members of staff (4 women; 5 men) were trained in basic theory of combustion and heat transfer, how a stove works, what makes an efficient stove, and basic principles of making fixed stoves with and without a chimney. The training also provided for a practical session for the construction of mud smeared stoves, which use locally available construction materials including bricks, soil and cow dung.

As a result of the trainings project staff conducted community based energy saving technology trainings where a total of 1,287 people (366 male; 921 female), 113 from Dowa, 412 from Salima and 762 from Ntcheu were trained. Each of the households that were trained has constructed a mud smeared stove of their own. The construction of energy saving mud smeared stoves has replicated to an additional 119 households because of its immediate benefit that it uses little firewood when cooking so it helps women to save time spent on fetching firewood while at the same time saving trees that would have been cut down for firewood. Figure 7 below indicates the number of people trained and the number of energy saving stoves constructed by geographical area.

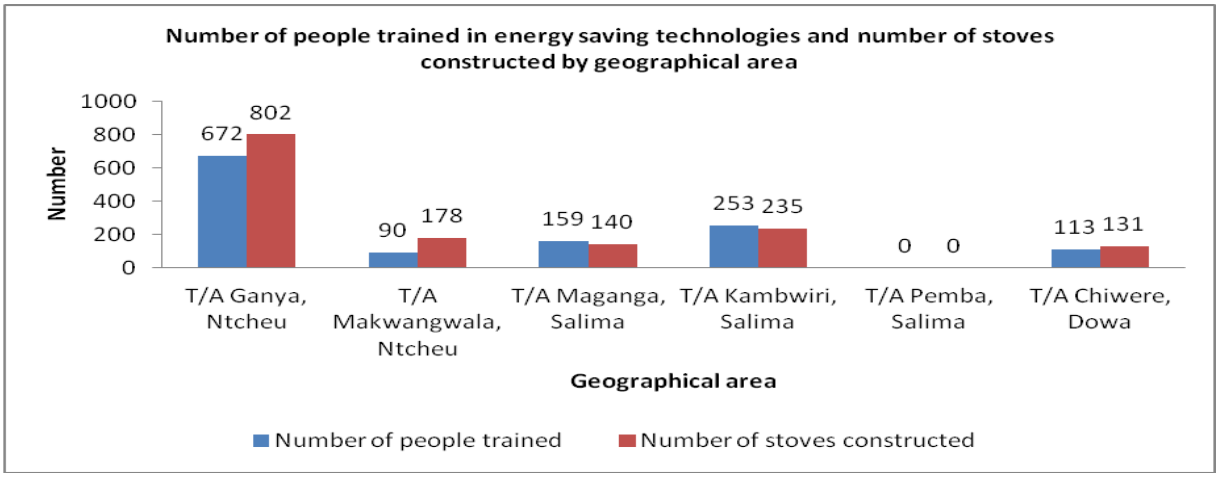


Figure 7: Number of people trained in energy saving technologies and number of stoves constructed

Flood response and early recovery actions

In response to the declaration for a state of disaster by the President of the Republic of Malawi on January 13, 2015, the project used some funds to procure and distribute sweet potato vines and cassava cuttings to 3,514 flood-affected households (2257 female-headed; 1257 male-headed) in Ntcheu and Salima. The distribution was part of flood response and early recovery actions as directed by the Malawi Government`s Department of Disaster and Management Affairs (DoDMA), where about 1,456 hectares of land was reportedly washed away during the flash floods. None of the infrastructure constructed by DICE II was damaged. See Table 7 below.

Table 7: Flood response and early recovery actions by DICE II

Districts : Salima and Ntcheu							
Distribution Date	FDP and District Name	GVH	TA	Number of HHs served	Number of beneficiaries		Items distributed
					>18 years		
					F	M	
21st March, 2015	Chinguluwe - Salima	Mwalala & Mkhuki	Kalonga	300	195	105	Sweet Potato Vines
22nd March, 2015	Maonga - Salima	Maonga	Kalonga	200	130	70	Sweet Potato Vines
22nd March, 2015	Nanjoka - Salima	Kamzimbe	Kalonga	500	325	175	Sweet Potato Vines
30th March, 2015	Chinguluwe - Salima	Mwalala & Mkhuki	Kalonga	314	195	119	Cassava Cuttings
30th March, 2015	Maonga - Salima	Maonga	Kalonga	200	130	70	Cassava Cuttings
25th March, 2015	Sharp Valley - Ntcheu	Chitsulo,Agabu, Salota, Chawanje	Ganya	1000	650	350	Sweet Potato Vines

25th March, 2015	Kasinje - Ntcheu	Kasinje, Kambewa and Katandilo	Ganya	500	325	175	Sweet Potato Vines
25th March, 2015	Khola - Ntcheu	Gwale, Gwaza and kachinga	Ganya	500	325	175	Sweet Potato Vines

Subsector 2: ERMS - Microcredit

Activity 1 – *Promotion of Village Savings and Loans (VS&L) groups*

During project inception, it was established that in some of the areas where the project is working there are a few or very weak VS&L groups. As such, the project conducted VS&L methodology training for 36 (9 women; 27 men) extension staff, 10 from CARE Malawi, 5 from Total Land Care and 21 from Government's Agriculture Extension and Irrigation Departments.

The extension staff facilitated the identification and training of village agents in village savings and loans methodology. These village agents provide backstopping training and monitored how the VS&L groups are functioning. They also provided support to new groups that continuously form in the target communities.

The project has worked with 141 V&L groups in Ntcheu Salima and Dowa districts against a target of 150 VS&L groups. All these groups have been trained in VS&L methodology. It is expected that, as a result of multiplier effect, more groups will form across the communities which will result in establishment of well over the target of 150 VS&L groups. A total of 2,498 people (2,094 women; 404 men) beneficiaries are currently participating in the VS&L groups. Each VS&L group has a committee consisting of a chairperson, secretary and treasurer whose responsibilities include upholding the group's constitution, recording savings, managing the social fund and keeping the cash box for the group. All VS&L trainings conducted by the project focused on providing knowledge of VS&L methodology and on building capacity so that the groups are sustained even after the project period ends.

The project conducted an Economic Activity Selection Planning and Management (EASPM) training for Village Agents and DICE II project staff. The objective of the training was to impart knowledge to village agents on how to select, run and manage economic activities. The training covered the following:

- Five pillars for selecting an economic activity, which are:
    - pillar 1: skills, experience, time
    - pillar 2: market
    - pillar 3: capital

  - pillar 4: profit
  - pillar 5: expenses
- Planning of activities when undertaking an economic activity
- Management of an economic activity

A total of 22 village agents (14 women; 8 men) and 9 DICE II project staff (4 women; 5 men) attended the training.

Cross cutting activities

Activity 1 – *Gender*

The project made sure that women took part in key positions. Due to the intensely technical nature of the project activities, literacy was often a requirement for involvement. While low female literacy levels sometimes limited the number of women who were able to participate, for example as extension staff, women were recruited whenever available.

Activity 2 – *HIV and AIDS*

The project embedded issues of HIV prevention, treatment and support services in all the project structures including VSL and irrigation schemes. The idea was to ensure that women and girls were well informed of HIV and AIDS and be included in the project interventions. Crucially was how the farmers themselves included the HIV positive people in the project. Also most of the beneficiary households are keeping people living with HIV..

OVERALL PERFORMANCE ANALYSIS

(a) Promotion of small scale irrigation – the project has ably achieved the requirements under promotion of irrigation based on the statistical data provided (Irrigation schemes planned – 30, achieved 34; membership planned – 2,000, achieved 2,274; hectares planned – 160, achieved 218.38).

(b) Promotion of conservation agriculture practices (CA) – the project has achieved the requirements under promotion of conservation agriculture practices based on the statistical data provided (planned number of farmers trained in CA – 4,000, achieved number of farmers trained in CA – 4,033)

(c) Promotion of agro forestry and water shade management - the project has achieved the requirements under promotion of agro forestry and water shade management practices based on the statistical data provided (planned number of farmers trained in agro forestry and water shade management – 4,000, achieved number of farmers trained agro forestry and water shade management – 4,033).

Based on the facts above we can comfortably say the project has reached the proposed objectives.

SWOT ANALYSIS

STRENGTHS

- The project had enough resources (funds, adequate and qualified staff at the inception of the project, and construction materials).
- Partnership with Total Land Care, government departments enhanced implementation of project interventions.
- Site identification and assessment of irrigation schemes were done in partnership with government staff and communities.
- Adequate capacity development for CARE staff, government staff, community structures (WUCs, Lead Farmers, Community Facilitators) and project participants, which resulted in project staff implementing all the 8 interventions in the project.
- Involvement of local leaders in trainings, which has lessened disputes over land tenure and increased ownership of project resources.

WEAKNESSES

- Delayed linkage of farmers to farm business schools where it was indicated to be a need as communities were empowered in agro-production and increased the volume of their produce but were not aware of market orientations and engagements with potential buyers. However, this was proposed in the no cost extension and was completed.
- Limited time frame to incorporate and link adolescent girls to the department of youth at district level as IAG activities were complex and needed a lot of time .

OPPORTUNITIES

- Willingness of communities to contribute to the project – communities contributed local construction materials like sand, stones, and labour.
- Availability of adolescent girls to participate in the project and the willingness of parents as well as local leaders to allow adolescent girls to participate.
- Availability of existing machinery such as government staff.

THREATS

- Project duration: some of the activities implemented by the project need further monitoring. E.g. IAG activity continuity with Government, functionality of marketing committees and linkage to potential buyers since the committees were linked in the last phase of the project and lacked hands on experience in market linkages and felt that functionality might be compromised.

LESSONS LEARNED

- High adoption rate among female beneficiaries in irrigation activities and VS&L contributed positively to food self sufficiency and economic empowerment in DICE II impact areas.
- Introduction of seed systems has sustained the availability of high quality seeds among vulnerable households.
- High community participation in most irrigation schemes facilitated community mobilization for local resources like Sand, Stones and bricks for irrigation site development.
- Low literacy levels and negative traditional norms being practiced in some impact areas, negatively affected active community participation in project interventions.
- Field tours, exchange visits, On Farm Demonstrations and field days, have facilitated learning among farmers.
- Through different trainings that the project has offered, the project beneficiaries have gained a lot of knowledge, information and skills in different areas which enabled them to effectively manage their activities on their own, hence a good approach for sustainability.
- The construction of permanent water storage facilities and structures has reduced the labour of constructing temporary weirs each farming season which was laborious and hectic to farmers and has increased hectares under irrigation because there was no water seepage.
- Introduction of energy saving stoves, coupled with numerous trainings conducted to beneficiaries in DICE II impact areas, will promote conservation of forest reserves and natural trees in the impact areas.
- The establishment of Village Savings and Loans / VSL is strong force behind continuation of activities at scheme level, as funds from VSL are used to finance continued activities under irrigation agronomy which includes purchase of hybrid seed and fertilizers.
- Continued technical support from the government extension staff will in turn promote sustainability of project interventions after the project phases out.
- Availability of community based extension structured (WUCs, Lead farmers, Irrigation technician, VAs and CFs) will promote sustainability of project interventions.
- The project has learnt that irrigation farming promotes food security, farmers who used to have food for 5 months period have extended the months of food availability 9 months, while selling the surplus for other household use.

- Introduction of collective marketing committees in the 34 irrigation schemes and linkages to Farm Field Business Schools is an eye opener to the farmers and if applied farmers will have a great opportunity for their development.
- The use of government staff as facilitators in IAG is vital for the achievement of results as it leverages on the expertise from several people.

CHALLENGES

- Erratic rains led to low water table or drying up of water sources for irrigation in T/A Makwangwala (Mikuyu, Nansale and Ngoni irrigation schemes) and T/A Kambwiri (Luso, Chitsanzo and Chiyangayanga irrigation schemes). However, these irrigation schemes were reached by the project through other interventions like Conservation Agriculture, Post-Harvest Loss Management, Agro- forestry and watershed management.
- Staff resignations (3 field staff – 1 for Ntcheu, 1 for Dowa and 1 for Salima) led to increased work load for remaining staff.
- Change of Project Managers led to change in project implementation strategies and delayed some of the activities that were scheduled.
- The final evaluation report indicated that there was evidence that girls had not fully internalized an understanding of DRR. In addition, the girls' counselors demonstrated little knowledge about their roles and responsibilities, let alone the linkage between the IAGs to DRR. As a result, the IAG activity left many girls with increased awareness of DRR but with little direction about the way forward.

RECOMMENDATIONS

- IAG activities targeting a large number of adolescent girls should be implemented as a stand-alone project, considering the logistics involved and the number of modules to be facilitated to adequately convey the importance of DRR and to build capacity among girls for incorporating DRR into their own lives.
- In order to complement crop production efforts initiated by the project and indeed consolidate food security gains at the household level, there is a need to integrate small scale livestock production in such initiatives such as DICE II. This will also help to boost income generation, human nutrition as well as manure production.

Please see Annex A – Final Project Evaluation Report for further learnings and recommendations from the program.

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MONITORING TRACKING TABLE

Indicator		Baseline, 2012	Final Evaluation, 2015	Target, 2015
Sector: Agriculture and Food Security				
Sub-sector: Seed Systems and Agricultural Input				
% households with food throughout the year		41%	65.6%	-
Number of months of food self-sufficiency per year among target households		5 months	91% with at least 9 months of food	9 months for 100%
Total number of girls trained in integrating adolescent girls in DRR		0	96%	1000
% of farmers benefiting from seed systems/agricultural input activities		44%	63,8	4,000
% farmers trained in irrigation technologies and agronomy		33%	96.2%	-
Actual number of hectares (ha) irrigated for winter cropping as a result of irrigation structures		0	0.05 ha per farmer	160 ha
Actual number of hectares (ha) planted with distributed seeds		-	0.04 ha per farmer	160 ha
Amount of harvest due to winter cropping for major crops	Maize	0	338.0kg	-
	Irish potato	0	137.3kg	-
	Tomatoes	0	707.7kg	-
	Cabbage	0	1,127.8kg	-
# of structures developed in the irrigation sites	Weirs	0	22	-
	Canals	0	45	-
	Shallow wells	0	43	-
% of farmers trained in conservation agriculture practices		43%	95.7%	4,000

% of farmers adopting appropriate CA technology	15%	33,8%	60%
% of farmers trained in Agro forestry and Water shed management.	16%	90.4%	4,000
% of targeted farmers adopting Agro forestry and watershed management.	-	51.6%	60%
% of farmers trained in postharvest loss reduction practices.	37%	82.3%	4,000
% of targeted farmers adopting appropriate postharvest loss reduction practices.	-	39.8%	60%
% of farmers from management structures trained in leadership, group dynamics and operation and maintenance	29%	84.5%	2,000
% of management structures that are functioning appropriately	14%	93%	75%
% of WUCs trained in disaster preparedness, mitigation and management.	12%	48.6%	30
Number of WUC committees linked with governments EWS program, and integrated with civil protection committees in the target areas.	0	29.9%	20
Subsector 2: ERMS - Microcredit			
Average income generated from VSL and harvest through irrigation	-	MK117,320.35	
% of farmers participating in VS&Ls	41%	72%	2,000
Percent of VS&L groups functioning properly according to internal rules	53%	89.9%	90%

PROGRAM PHOTOS

Left: DICE team and Government staff conducting environmental and social screening survey in Dowa district.

Left: Irrigation technology and agronomy training session in Salima District.

Left: A group of Extension staff on a group discussion during irrigation agronomy training – Salima

Right: Community sensitization meeting at M'memo

Left: USAID representative (Emmanuel Ngulube - left) planting a tree during DICE II project launch held on 22nd April 2013 in Salima.

Left: Mayankho adolescent girls' group from Salima singing songs during Kylah and Jennifer's IAG monitoring visit to Malawi, 24th June 2013.

Above Right: A DICE II project beneficiary in Ntcheu showing a tree she planted in April 2013 using the truncheon system which the project is promoting.

Left: A group of Extension staff constructing a granary during Postharvest Loss Management training practical session. The training was conducted from 17th to 21st June 2013 in Salima.

Right: A woman attending to her plot at Lowe Irrigation scheme in Ntcheu, June 2013

Left: a lead farmer at Khomba irrigation scheme in Ntcheu demonstrating maximum soil cover using Maize stalks, during community based conservation agriculture training, June 2013

Left: A DICE II project beneficiary showcasing a canal constructed by DICE II project during field day held on 13 August 2013 at Moyo Irrigation scheme in Salima.

Below: An adolescent girl from "Mayankho" IAG group in a Maize plot which was allocated to the group by the WUC as part of the Integration of Adolescent Girls in DRR. The photo was taken on 13th August 2013 during an IAG community event in Salima .

Left: A DICE II project beneficiary in her Maize field at Chidawi Irrigation Scheme in Salima showing a tree she planted using the truncheon system which the project is promoting. (photo taken on 9th July 2013).

Above Right: A main canal under construction at Nansale Irrigation Scheme in Ntcheu – 1st August 2013.

Left: A project beneficiary in her Maize field at Khomba Irrigation Scheme in Ntcheu – 22nd August 2013.

Left: Sineyi Josiya, Community facilitator for Mikuyu Irrigation scheme in Ntcheu district showcasing tree seedlings planted using seeds and polythene tubes distributed by DICE II project. The photo was taken on 10 December 2013.

Below: DICE II project participants at Mkaika Irrigation scheme in Salima district in a tree nursery fence doing pot filing in readiness to plant tree seeds. The photo was taken on 22 October 2013.

Left: Loyce Zemba and Saidi Phula mulching a conservation agriculture demonstration plot for rain fed cropping at group village headman M'memo in Ntcheu district. The photo was taken on 10 December 2013.

Above: Irrigation scheme development – Alex Banda an Irrigation technician constructing a weir for Nkondodzi irrigation scheme in Dowa district as Mwandilanga Kumasala, Dowa district irrigation officer under the ministry of irrigation, far left, provides technical advice. – The photo was taken on 23 October 2013.

Left: Irrigation scheme development – Efilemu Malema an Irrigation Technician doing canal alignment at Chindungwa Irrigation scheme in Salima district. The photo was taken on 18

October 2013.

Above: Saidi Phula (left) a member of Mngoni Irrigation scheme in Ntcheu district showcasing a mlombwa tree which was grown using truncheon system. The tree has been grown along Mngoni river which is a testimony of effects of climate change as it runs out of water from the month of September until rains start in December. Mlombwa tree has water holding capacities. The photo was taken on 10 December 2013.

Left: Out-planting of tree seedlings at at Liganga irrigation scheme – a member of Liganga Irrigation scheme in Salima district planting a tree seedling sown using seeds and polythene tubes distributed by DICE II project. The photo was taken on 13 February 2014.

Below: OFDA representative William Weimer, standing far left, and CARE Malawi Director of Food and Nutrition Security programs, Lemekeza Mokiwa, standing far right with representatives from Mikuyu, Nansale and Mngoni irrigation schemes in Ntcheu after a field monitoring visit to Mikuyu irrigation scheme. The photo was taken on 7 January 2014.

Left: Conservation agriculture, maximum soil cover, - Teleza

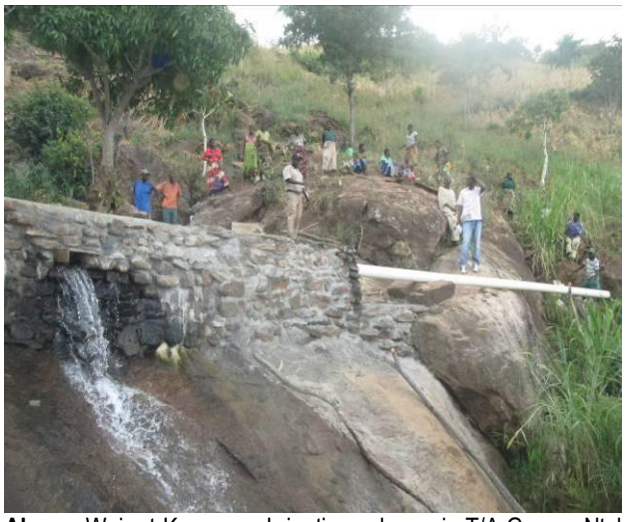
Kachiwala, vice chairperson for Chauluka irrigation scheme in her garden of maize planted under maximum soil cover at Chauluka irrigation scheme in Ntcheu district. The photo was taken on 1 February 2014.

Above: Bwanje irrigation scheme (T/A Ganya) field day – Samuel Austen in green (chairperson of the scheme) explains the truncheon system of planting trees to participants. The glycedia tree which was used as a display during the event has soil enriching capabilities and was planted in December 2013. The photo was taken on 25th March 2014.

Left: Conservation agriculture, growing of ground cover crops, – Glem Manda secretary for Nkondozi irrigation scheme in Dowa in his soya beans demonstration plot. The photo was taken on 12 February 2014.

Above: Main canal constructed at Kachimbwi irrigation scheme in Dowa. The photo was taken on 2nd December 2014.

Above: Canal at Chauluka Irrigation scheme in T/A Ganya, Ntcheu. The photo was taken on 6th May 2014.



Above: Weir at Kamwaza Irrigation scheme in T/A Ganya, Ntcheu. The photo was taken on 6th May 2014.

Above: Canal at Kaziputa Irrigation scheme in T/A Ganya, Ntcheu. The photo was taken on 10th June 2014.

Above: Weir and pillar to support pipeline to main canal at Makawala Irrigation scheme in T/A Chiwere, Dowa. The photo was taken on 8th May 2014.

Above: A shallow well and a main canal at Moyo irrigation scheme in T/A Maganga, Salima. Picture taken on 6th June 2014.

Below: Truncheon trees demonstration plot which acts as a learning point for the truncheon system of growing trees at Madzidzi irrigation scheme, T/A Chiwere in Dowa. The photo was taken on 8th May 2014. In the picture Gelesoni Lefani, Community Facilitator.

Above: Beans plot at Kamwaza Irrigation scheme in T/A Ganya, Ntcheu. The photo was taken on 23rd September 2014.

Above: Maize plot at Nankhanu Irrigation scheme in T/A Ganya, Ntcheu. The photo was taken on 23rd September 2014.

Above: Pipe installation at Kamwaza Irrigation scheme in T/A Ganya, Ntcheu. The photo was taken on 22nd September 2014.

Above: community based energy saving technology training at Mkondodzi irrigation scheme in T/A Chiwere, Dowa. Picture was taken on 9th July 2014.

Above: community based post harvest loss management training – construction of mud smeared granary at Chindungwa Irrigation scheme in T/A Pemba, Salima. The photo was taken on 18th July 2014.

Below: Banana suckers that were distributed to be planted along irrigations schemes as part of water shade management.

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SUCCESS STORIES

WHEN A LITTLE MEANS A LOT

Lingison Sefasi Kuyenda is a 45-year-old man who hails from Chimbalanga, a village an hour drive from the Malawian capital Lilongwe, Group Village Head (GVH) Nansungwi, Traditional Authority (TA) Chiwere, in Dowa district. He dropped out of school while in standard three because his parents could not afford to pay his school fees. He got married to Chrissie Ziyambe who comes from Nansungwi village on 12th September 1992 with whom he has six children. First is Antony born on 1st May 1994 and has just written standard 8 exams in May 2014. Second is Charles born on 17th December 1996 and dropped school four years ago for no any valid reasons. Third is Hasten born on 21st May 1999 and he is in standard 4. The fourth is Adaniya born on 3rd May 2001, she is in standard 3. The fifth is Stelia born on 29th October 2005 and she is in standard 2. The sixth is Manesi born on 10th October 2010 and not yet in school. The entire children trek daily to Ching'amba primary school a 5 kilometer distance from Chimbalanga village.

Starting from when he got married, Lingison has depended on agriculture and concentrated on the growing of maize, groundnuts for food and tobacco for cash. In 2011 he harvested 8 bales of tobacco which he sent to Kanengo auction floors. Unfortunately, 3 bales got lost and he realised K32, 000 from the remaining 5 bales. From what he experienced, Lingison vowed never to grow tobacco again but rather to concentrate on growing maize and groundnuts as cash crops. As an energetic man, he tried all he could to raise (improve) his household in terms of food security and financial stability but to no avail. The more he tried the more frustrated he was becoming because he could neither see nor feel any improvement.

"*In 2005 a government extension worker told us the people of Chimbalanga village to start irrigation agronomy on a small scale using the locally available resources. It was done but we were not taught modern agronomic practices. Two years later another local NGO (Total Land Care) provided us with maize and paprika seed to plant at the irrigation site. We cultivated, but did not benefit anything from this kind of crop because there was no market for paprika".* Lingison lamented.

It was a sunny morning a year and half ago when Lingison heard of a meeting to be convened by CARE Malawi staff (DICE II project) to talk of irrigation as an intervention on drought mitigation. "*At the meeting we were told that CARE will help us to develop the irrigation site and we shall have chance of receiving various types of seed for winter growing as well as rain fed"* explained Lingison and said he was so happy and ready to participate.

When DICE II project started in 2012, the Care Field Officer (FO) started working with people from Chimbalanga village on irrigation development and during winter season of 2013, the project distributed 4 packets of cabbage, 20

kilograms maize, 4 packets tomato 4 packets mustard and one tin onion seed to the irrigation members. The FO divided the people into small groups to grow the seed he brought at the irrigation site. Even though Lingison has a limited education, he understood the significance of the proposed idea of working in groups, sensed it is potential and soon accepted it in his heart. "So by the grace of God it happened that I was one of the two people to plant cabbages," Said Lingison. The FO trained the scheme members on all agronomic practices. Lingison managed to plant 848 heads of cabbages. He followed all the advices given by the FO and his crop stand was good.

When the cabbages were matured in October 2013, he took a sample and went round Mvera trading centre and lucky enough a vendor from the police roadblock offered him to buy at K100 per head and this was a farm gate price. Lingison sold his produce in two days time. On the first day, he got K72, 000 and on the second day, the remaining heads were medium, sold at K80 per head, and realized K5, 000, total sales were K77, 000.

After sales Lingison thought of involving his wife to make a decision on what to do with the money and they agreed to buy four bags of fertilizer in preparation for rain fed season and use the remaining money to buy iron sheets.

It was late October, 2013 when he went to Mvera Farmers World shop to buy the four bags of fertilizer and realized that the shop stocks iron sheets that his initial plan was dropped and his dream was rekindled "*I would want to show my fellow irrigation members how I have benefitted with the little seed and with this initial success my vision is that one day I should be living in an iron roofed house with a cemented floor.*" Narrated Lingison.

He went back home and agreed with his wife to buy two bags of fertilizer and use the other money to buy iron sheets. One day in early November, he went to Mvera Farmers World shop where he bought two bags of fertilizer at K31, 000.00 and used K39, 000.00 to buy 12 iron sheets out of the 28, which they require.

His plans to fulfill his vision are to buy six packets of marcanta cabbage seed from which he would plant 1, 000 to 2, 000 heads during the 2014 winter cropping season so that he can sell more and make his dreams come true.

"Even if DICE project pulls out, I will point out what I have benefitted. A simple idea supported by an initial 4 packets of cabbage seed changed my life, helping to pull my family out of cycle of poverty and look forward. Indeed a little means a lot if well managed." Explained Lingison with a smile.

Above Left: Lingison pointing at the 12 iron sheets which he bought hanged under the roof of his house - indeed "*A little means a lot if well managed*"

Above Right: From left to right Chrissie Ziyambe (wife), Manesi (6th born child), grandchild and Lingison

Left: Lingision's compound

INTEGRATING ADOLESCENT GIRLS IN COMMUNITY BASED DRR

In Malawi, girls are often considered the safety nets for the household. Young girls are frequently tasked with fetching water, collecting firewood, and caring for siblings. When faced with limited resources, cultural preference is for boys to attend school, as girls are believed to be better suited to helping with household chores or income generating activities. Poverty, demands of the household, and gender bias impede girl's ability to attend school. The demands are highest upon households during disaster, forcing many girls to drop out of school. Female adolescent dropouts may be one of the most vulnerable populations to climate related disaster, as limited education constrains their capacity to cope. These girls are often pressured into early marriage or food-for-sex exchanges, as early as the age of twelve. With limited education, many girls are convinced their best option for future food and economic security is marriage.

IAG is an education program targeting adolescent girls (a population vulnerable to issues of climate change) into community based disaster risk reduction efforts. Funded through US AID and implemented by CARE Malawi, the pilot of the IAG program has been introduced through pre-existing relationships at irrigation sites in Salima and Ntcheu districts. Each site hosts 20 adolescent girls ranging in age from 13-19 years of age. Curriculum has been developed by North Western University in South Africa, and adapted to local context, covering a wide range of issues such as nutrition, first aid, climate change, and health. The trainings encourage the girls to take ownership of the challenges facing their community, and to become advocates for their unique needs.

A FUTURE FOR TABALIRE?

IAG Malawi is notable for its ability to reach girls currently dropped out of school, with over one third of the participants currently out of school. The innovative approach of utilizing irrigation sites for community entry has allowed the Malawi IAG project to reach highly vulnerable and frequently underserved adolescent girls. During sessions, girls with disparate levels of educational attainment come together for peer-based discussion, skills trainings, and hands-on activities.

In Ntcheu, the IAG has been instrumental in inciting renewed interest in education. Tabalire Henderson dropped from school at the age of ten to help her family sell roasted corn. Tabalire had not attended school in three years, but facilitator's repeated messages about education, and, in particular, a session on career guidance, sparked renewed interest in education. She realized, "to have a good future, you need school." With the encouragement of IAG facilitators and CARE staff, she returned to standard 4 during the program. When asked about what job Tabalire would like to have, she thinks for a long moment before a bright smile flashes across her face. She suppresses a grin as she says, "I want to help other girls to return to school." Tabalire may have discovered her hidden talent, as she helped to encourage fifteen-year-old IAG participant Annie Kennedy to also rejoin school. Seven other girls in Ntcheu have expressed interest in returning to school next year. If Tabalire has her way, there will definitely be a few more IAG faces in Ntcheu school district next year.

COST EFFECTIVENESS ANALYSIS

Overall, the DICE II project has been so effective in the implementation of its activities. The project has ssuccessfully achieved the intended outcomes by ensuring that the designed outputs deliver the expected/desired outcomes. The Monitoring Tracking Table above highlights the key indicators and targets met which in most cases surpasses the design targets. Unfortunately the project outputs are a mix of both qualitative and quantitative hence there is no direct correlation in computation of unit costs. However, at the end of the project period there were cost savings and the project requested part of the funds to be used in emergency response to the flood and heavy storm disaster that hit the DICE II working areas.

Over the project timeline there has not been any significant cost impacts such as major exchange rate fluctuations or other types of inflation.

ANNEXES

Annex A – Final Project Evaluation Report – DICE II