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RURAL ASSETS CREATION PROGRAMME IMPACT ASSESSMENT

FINAL REPORT



*Rural Areas Economic
Development Programme PIU*



*AM Partners
Consulting Company*

Content

1 EXECUTIVE SUMMARY..... 1

2 INTRODUCTION 5

2.1 RACP BACKGROUND 5

 2.1.1 General introduction..... 5

 2.1.2 Programme Component 1 - Support to Fruits and Nut Sector (Fruit Armenia)..... 6

 2.1.3 Programme Component 2 - Rural Infrastructure 7

2.2 IMPACT ASSESSMENT OBJECTIVE..... 8

2.3 IMPACT ASSESSMENT METHODOLOGY 8

 2.3.1 Information Collection..... 8

 2.3.2 Sampling 9

 2.3.3 The IA Implementation Modalities 10

 2.3.4 Data analysis..... 10

3 ARMENIA: DYNAMICS OF MAJOR SOCIO-ECONOMIC INDICATORS IN 2010-2016 11

4 RACP RESULTS: COMPONENT 1 (FRUIT ARMENIA) 14

 4.1 EFFECTIVENESS..... 14

 4.2 IMPACT..... 16

 4.3 SUSTAINABILITY..... 28

 4.4 OTHER ISSUES..... 29

 4.5 WRAP-UP CONCLUSION 34

5 RACP RESULTS: COMPONENT 2 (INFRASTRUCTURE REHABILITATION) 35

5.1 REHABILITATION OF PUBLIC UTILITIES: NATURAL GAS SUPPLY 35

 5.1.1 Effectiveness..... 35

 5.1.2 Impact 37

 5.1.3 Sustainability 46

 5.1.4 Other Issues 47

 5.1.5 Wrap-Up Conclusion 54

5.2 REHABILITATION OF PUBLIC UTILITIES: DRINKING WATER SUPPLY 55

 5.2.1 Effectiveness..... 56

 5.2.2 Impact 58

 5.2.3 Sustainability 68

 5.2.4 Other Issues 70

 5.2.5 Wrap-Up Conclusion 76

5.3 REHABILITATION OF PUBLIC UTILITIES: SANITATION AND SOLAR SYSTEMS 77

 5.3.1 Effectiveness..... 77

 5.3.2 Sustainability 79

 5.3.3 Wrap-Up Conclusion 79

5.4 REHABILITATION OF VALUE CHAIN INFRASTRUCTURE: IRRIGATION WATER SUPPLY..... 79

 5.4.1 Effectiveness..... 79

 5.4.2 Impact 84

 5.4.3 Sustainability 105

 5.4.4 Other Issues 107

 5.4.5 Wrap-Up Conclusion 112

6 RACP OUTREACH..... 114

7 OVERALL CONCLUSION AND RECOMMENDATIONS FOR FUTURE INTERVENTIONS 118**List of Tables**

Table 1 - Sampling of the communities and respondents for the quantitative survey by the RACP sub-components	9
Table 2 - Stakeholder survey respondents	9
Table 3 - Macroeconomic indicators	11
Table 4 - Nominal consumer expenditures per household	12
Table 5 - Average annual per capita consumption of main types of food	12
Table 6 - Poverty and extreme poverty incidence by types of settlement	13
Table 7 - Poverty incidence by marzes and Yerevan city	13
Table 8 - Land of smallholder farmers put under fruits/nut production, Ha.....	15
Table 9 - Number of rural people living on less than \$4.30 per day	16
Table 10 - Increase of household asset ownership.....	17
Table 11 - Households with improvement in household asset ownership	18
Table 12 - Size and structure of beneficiary households' income	18
Table 13 - Increase in income	19
Table 14 - Change in income	19
Table 15 - Increase in the value of land put under orchards	19
Table 16 - Possibility of income segregation by gender of HHS members	20
Table 17 - Household Incomes by gender	20
Table 18 - Household expenditures by type	21
Table 19 - Land under production adopting modern technologies	22
Table 20 - Value of the land by category	23
Table 21 - Community specific main (Top 5) crop	24
Table 22 – Sales of crops harvested from the FA orchards in 2015	27
Table 23 - Production expenses: Peach and Peach-nectarine	27
Table 24 - Production expenses: Other Stone Fruits	28
Table 25 - People/HHS in target area	29
Table 26 - Average HH size	29
Table 27 - Age.....	30
Table 28 - Education level.....	31
Table 29 - Marital status.....	31
Table 30 - Occupation	31
Table 31 - Women and youth groups and indigenous people in target area, 2016	31
Table 32 - Development organizations and their programs in targeted communities (FA component)	32
Table 33 - Communities and households receiving (infrastructure) project services, NGS systems constructed/rehabilitated	36
Table 34 - Number of rural people living on less than \$4.30 per day	37
Table 35 - Increase of household asset ownership.....	38
Table 36 - Households with improvement in household asset ownership	39
Table 37 - Size and structure of beneficiary households' income	39
Table 38 - Increase in income	40
Table 39 - Change in income	40
Table 40 - Other positive implications of the RACP implementation	40
Table 41 - Extent of heating houses in the winter	41
Table 42 - Use of different fuel	42
Table 43 - Reduction of firewood used for heating and cooking	42
Table 44 - Time spent for wood collection	43
Table 45 - Household Incomes by gender	43
Table 46 - Household expenditures by type	44
Table 47 - Production processing by type.....	45
Table 48 - Number of businesses established and employment generated due to implementation of NGS sub-component and	46
Table 49 - Beneficiaries' awareness on irrigation system O&M	47
Table 50 - People/HHS in target area	47
Table 51 - Age.....	48

Table 52 - Education level	49
Table 53 - Marital status	49
Table 54 - Occupation	49
Table 55 - Women and youth groups and indigenous people in target area, 2016	50
Table 56 - Development organizations and their programs in targeted communities	51
Table 57 - HHHs' perception on their livelihood improvement due to the project	54
Table 58 - Communities and households receiving (infrastructure) project services, DWS systems constructed/rehabilitated	57
Table 59 - Effectiveness of social (water) infrastructure	57
Table 60 - Number of rural people living on less than \$4.30 per day	58
Table 61 - Increase of household asset ownership.....	59
Table 62 - Households with improvement in household asset ownership	60
Table 63 - Size and structure of beneficiary households' income	60
Table 64 - Increase in income	60
Table 65 - Change in income	61
Table 66 - Household Incomes by gender	61
Table 67 - Other positive implications of the RACP implementation	61
Table 68 - Household expenditures by type	62
Table 69 - Production processing by type.....	63
Table 70 - Livestock and poultry.....	64
Table 71 - Productivity of livestock and poultry by type	65
Table 72 - Animal husbandry expenditures by type	65
Table 73 - Household member/members in charge of collecting water, share in total	66
Table 74 - Time spent for water collection	66
Table 75 - Total water used by HH	66
Table 76 - Change in number of diseases	67
Table 77 - Backyard irrigated with drinking water, ha	67
Table 78 - Effectiveness: Improved agricultural and livestock production	67
Table 79 - Likelihood of sustainability of Social Infrastructure	68
Table 80 - Beneficiaries' awareness on DWS system O&M	69
Table 81 - Likelihood of sustainability of groups managing social infrastructure	69
Table 82 - People/HHs in target area	70
Table 83 - Average HH size	70
Table 84 - Age.....	71
Table 85 - Education level.....	72
Table 86 - Marital status.....	72
Table 87 - Occupation	73
Table 88 - Women and youth groups and indigenous people in target area, 2016	73
Table 89 - Development organizations and their programs in targeted communities (DWS sub-component).....	74
Table 90 - Implementation status of Pilot Projects implementation	77
Table 91 - Communities and HHs benefitting from the irrigation schemes constructed/rehabilitated. Land under irrigation schemes constructed/rehabilitated	80
Table 92 - Farmland (arable land) under irrigation schemes constructed/rehabilitated	81
Table 93 - Land structure, ownership, and use after (2016) and before (2010) RACP implementation	82
Table 94 - Change in irrigable and irrigated land area	83
Table 95 - Effectiveness of productive water infrastructure	83
Table 96 - Improved agricultural and livestock production	84
Table 97 - Number of rural people living on less than \$4.30 per day	84
Table 98 - Increase of household asset ownership.....	85
Table 99 - Households with improvement in household asset ownership	85
Table 100 - Size and structure of beneficiary households' income	86
Table 101 - Increase in income	87
Table 102 - Change in income.....	87
Table 103 - Increase in the value of land due to RACP reported by beneficiaries (for 57% that reported increase)	87

Table 104 - Change in value of land reported by respondents thinking that value of their land grew due to RACP implementation (by communities)	88
Table 105 - Other positive implications of the RACP implementation	88
Table 106 - Establishment of orchards in the rehabilitated area	90
Table 107 - Number of organizations (processors) procuring from the targeted communities	90
Table 108 - Processors procuring from target communities.....	90
Table 109 - Household Incomes by gender	91
Table 110 - Household expenditures by type	91
Table 111 - Improvements of the capacity and other features of irrigation systems.....	92
Table 112 - Volume of used irrigation water (m ³ /year).....	93
Table 113 - Community specific main (Top 5) crops.....	93
Table 114 - Production output by type (Gross agricultural output)	95
Table 115 - Production expenses by type.....	97
Table 116 - Production income of HHs from land cultivation activities	97
Table 117 - Production income of HHs from animal husbandry activities	97
Table 118 - Production processing by type.....	98
Table 119 - Change in features defining market accessibility in the period of 2010-2016.....	99
Table 120 - Ways of using of land cultivation products (Commercialization formula).....	100
Table 121 - Share of agricultural produce sold via various sales channels	101
Table 122 - Use of animal husbandry products	101
Table 123 - Procurers and sales channels for animal husbandry products.....	102
Table 124 - Effectiveness: Producers benefiting from improved access to markets	102
Table 125 - Availability of agricultural machinery and equipment	103
Table 126 - Ways of obtaining/using agricultural machinery and equipment	103
Table 127 - Livestock and poultry	104
Table 128 - Productivity of livestock and poultry by type	104
Table 129 - Animal husbandry expenditures by type	105
Table 130 - Likelihood of sustainability of productive infrastructure and WUAs	106
Table 131 - Beneficiaries' awareness on irrigation system O&M	106
Table 132 - People/HHs in target area	107
Table 133 - Average HH size	107
Table 134 - Age.....	108
Table 135 - Education level	109
Table 136 - Marital status	109
Table 137 - Occupation	109
Table 138 - Women and youth groups and indigenous people in target area, 2016	109
Table 139 - Development organizations and their programs in targeted communities	110
Table 140 - RACP Outreach.....	114

List of Figures

Figure 1 - Gender	30
Figure 2 - The age pyramid of population (HH members).....	30
Figure 3 - Importance of Component	33
Figure 4 - Satisfaction with the project results	33
Figure 5 - Gender	48
Figure 6 - The age pyramid of population (HH members).....	48
Figure 7 - Importance of Sub-Component	54
Figure 8 - Satisfaction with the project results	54
Figure 9 - Gender	71
Figure 10 - The age pyramid of population (HH members).....	72
Figure 11 - Importance of Sub-Component	76
Figure 12 - Satisfaction with the project results	76
Figure 13 - Impact of the irrigation water availability on the drinking water expenses and consequences	89
Figure 14 - Gender	108

Figure 15 - The age pyramid of population (HH members)	108
Figure 16 - Importance of Sub-Component	112
Figure 17 - Satisfaction with the project results	112

List of Maps

Map 1 - RACP implementation area	5
Map 2 - FA component implementation area	14
Map 3 - NGS sub-component implementation area	35
Map 4 - DWS sub-component implementation area	56
Map 5 - Sanitation / Solar Systems sub-component implementation area	78
Map 6 - IWS sub-component implementation area	80

List of Acronyms

DWS	▶ Drinking Water Supply
FA	▶ Fruit Armenia
GoA	▶ Government of Armenia
HH	▶ Household
IA	▶ Impact Assessment
IFAD	▶ International Fund for Agricultural Development
IWS	▶ Irrigation Water Supply
LFM	▶ Logical Framework Matrix
NGO	▶ Non-Governmental Organization
NGS	▶ Natural Gas Supply
NSS	▶ National Statistical Service of the Republic of Armenia
OFID	▶ OPEC Fund for International Development
PIM	▶ Project Implementation Manual
PP	▶ Pilot Projects
PUI	▶ Public Utilities Investments
RACP	▶ Rural Assets Creation Programme
RAED PIU	▶ Rural Areas Economic Development Programme Implementation Unit
RI	▶ Rural Infrastructure
RIMS	▶ Results and Impact Measurement System
ToR	▶ Terms of Reference
VCI	▶ Value Chain Infrastructure

1 EXECUTIVE SUMMARY

This Executive Summary highlights the key findings and conclusions of the completion review regarding the RACP effectiveness, impact, and sustainability. The most significant lessons and conclusions from the Project implementation, main challenges and success factors are summarized. The Summary also highlights the prospects for post-project sustainability strategy.

The overall goal of the RACP was **the reduction of rural poverty** by:

1. Establishing an economically viable fruits and nuts sector with backwards linkages to poor rural smallholders;
2. Establishing of the Fruit Armenia CJSC with 100% GoA share, which will be fully privatized for delivery of services to the fruits and nuts sector; and
3. Removing infrastructure bottlenecks that inhibit increasing participation of the economically active rural poor in enhanced commercialization of the rural economy.

The overall Programme goal and objectives were/are brought to life by the following components:

- ▶ Component 1: Support to Fruits and Nuts Sector;
- ▶ Component 2: Rural Infrastructure, and
- ▶ Component 3: Programme Management.

Programme target areas were Aragatsotn, Lori, Shirak, Vayots Dzor, Syunik, Gegharkunik, and Tavush marzes of the RA. The Component 1 have been implemented only in Tavush and Vayots Dzor Marzes and in selected sites of Aragatsotn Marz.

The objective of this Impact Assessment is to define the status of project output, outcome and impact indicators against the indicators defined in the last version of the revised Logical Framework Matrix of the RACP. The scope of the current Impact Assessment focuses on assessing the status of a set of RACP indicators extracted from the updated Logical Framework Matrix and the list of IFAD's Results and Impact Measurement System indicators. These indicators are presented in detail in Inception Report.

Providing the great variety of the indicators addressed, the necessary information has been collected from the following sources: Respective secondary materials, specialists and invited experts, stakeholders and key informants, and beneficiaries. Different sources of information were addressed via different methods and survey instruments. In general, the following major methods were applied: Desk review, in-depth interviews, and survey of beneficiaries.

Major findings regarding the Component 1 (Fruit Armenia) of the RACP include the following:

1. FA followed the recommendation of the IFAD Supervision Mission of 2015 and limited the establishment of orchards with 85 ha vs. planned 305 ha. However, the major reasons for such failure of achieving the assigned results have been the following: a) wrong/unjustified/untested design of the component, b) inefficient management of the component, and c) ineffective control over the implementation of the component from the side of all counterparts.
2. Overwhelming majority of the Effectiveness indicators (preparation of strategies and other documents, conclusion of contracts, etc.) was not achieved as of the RACP IA implementation moment.
3. 91% of beneficiaries of the RACP FA component registered increase of assets. Other indicators suggested for the measurement of Impact also grew. However, almost none of those increase (with major exception of the value of land used for establishment of orchards), can be attributed to implementation of the component. The change is significant - 100% - 560%.
4. Application of modern technologies (meaning drip irrigation, anti-hail nets, etc.) happened to a very limited extent - only in one community, on a small area.
5. Community specific crop structure changed positively. New, areas for cultivation of high-value crops grew for about 140 ha, 85 of which is ensured through the FA.
6. Intensive establishment of orchards started in 2013 and continued till 2015. Most of orchards were not of productive age as of the IA implementation moment. I.e. the productivity and yield figures were

assessed for just 2015, which is not representative for the whole component. It is too early to make conclusions about the long-term results and impact of the FA component.

7. The sustainability of the results of the FA component implementation is seriously threatened. In some locations, where proper cultivation is being implemented the results will definitely sustain, providing that proper Exit strategies will be developed, agreed and applied for transferring the orchards to their ultimate owners. However, that pre-condition was not ensured as of the IA implementation moment.

The following recommendations are made for the less painful closure of FA component and learning lessons:

- Urgently create a professional commission for developing reliable and effective (acceptable for all counterparts) exit strategy on transferring the orchards to the ultimate owners/beneficiaries and conduct actual transfer. Providing the previous ineffective cooperation between the management of the FA and the IFAD team, the version of delegating this task to other implementers (i.e. replacement of at least one team) is recommended.
- The amount spent for the FA component implementation is quite big and the results achieved against those funds are far not sufficient. Implementation of objective assessment going deep into details is recommended for learning lessons and identifying the bottlenecks that conditioned the non-achievement of the FA component results. This is the best way of avoiding similar mistakes in future similar initiatives. It is strongly recommended that assessment should be conducted with a joint team of international and local experts without involvement of actual implementers to avoid any conflicts of interests.

Major findings regarding the Component 2 (Rural Infrastructure) Natural Gas Supply sub-component of the RACP include the following:

1. The number of beneficiaries of the NGS sub-component is not limited with only local population. Additional beneficiaries are 14 public entities¹ (municipalities, schools, culture houses, ambulatories, etc.) and 6 businesses operating in the targeted communities.
2. 97% of beneficiaries of the RACP NGS sub-component registered increase of assets but only part of that increase can be attributed to the RACP implementation, since major results did not happen, yet. However, procurement of some HH items (boilers, water heaters, heating systems, stoves, ovens, etc.) is directly connected with the gasification of the communities. Almost 90% of beneficiaries procured such assets directly related to the implementation of the NGS sub-component. The range of such investments comprised \$168-\$1,528 on average. Finally, all HHs that connected to the NGS infrastructure invested 100-150 thousand AMD as onetime payment for getting connected to the (re)constructed NGD infrastructure.
3. Income of the surveyed beneficiaries grew for 21%, but only part of that increase can be attributed to the sub-component implementation, since major results did not happen, yet.
4. Average saving of firewood in surveyed HHs comprised 4.5m³ per HH, annually. Providing the number of benefiting HHs is 1,310 in all communities, the total volume of saved wood comprises about 5,900 m³. This figure can be also translated in ha of saved forest by considering an average of 700 m³/ha (0.5m³ of firewood from a mid-sized tree and 14 trees on 100 m²). Annual saving of the forest area comprises over 8 ha of forest annually. However, this figure will grow continuously and drastically along with the increase of the number of beneficiaries connecting to NGS infrastructure.
5. Involvement of HHs and their members in firewood related issues improved though not significantly. In any case, that left its positive effect especially on men, who were mainly in charge for the wood collection and cutting.
6. Implementation of the NGS sub-component resulted in establishment of 6 businesses with 68 employees. In addition, it created also positive expectations both in communities where the projects were completed, and where they are in process of implementation. Stakeholders from those communities also reported about establishment of businesses.
7. Once the NGS infrastructure is constructed/rehabilitated it is being handed over to the respective organization for further exploitation, operation, and management. There is only one organization in Armenia servicing this sphere - Gazprom Armenia CJSC. This organization is among the biggest, strongest, and most capacitated firms in Armenia. It has its tens of branches in all regions, sub-regions,

¹ In communities of Aragatsotn Marz (Apnagyugh, Aragats, Hartavan, Karbi, Kuchak, Ohanavan, Ujan, and Vardenis)

and towns of the country. Likelihood of sustainability of the infrastructure and managing organization -is Very Strong.

8. The extent of satisfaction among beneficiaries is very high. The great majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.

The following major reservation should be made in the context of the NGS sub-component IA implementation: Implementation of the IA was possible only in a part of communities where the rehabilitation of the NGS infrastructure was completed and handed-over for further exploitation. In the recent period, prices for gas steadily grew, which made overwhelming majority of consumers to limit their consumption for saving some costs. That is why, the gas is being used mainly for cooking. Regretfully, the population in rural areas continues using firewood and other fuel for heating purposes.

Major findings regarding the Component 2 (Rural Infrastructure) Drinking Water Supply sub-component of the RACP include the following:

1. Implementation of the IA was possible only in 2 communities (out of 26) where rehabilitation/reconstruction of the DWS infrastructure has been completed. Thus, the formal rate of the Effectiveness is not high, although it can immediately and drastically change once the DWS systems are completed and handed-over. However, on the basis of completed projects it could be concluded that significant positive dynamics was registered in terms of proportion of the delivered vs. required drinking water, growing share of HHs with secured access to water, and significantly increased service level.
2. 90% of beneficiaries of the RACP DWS sub-component registered increase of assets. Similar increase was registered also in income. However, that growth cannot be attributed to the implementation of the sub-component. Instead, other positive implications, such as resolving hygienic issues, use of respective home appliances, etc. took place, which should be directly and completely attributed to the implementation of the DWS sub-component.
3. Notable increase in animal husbandry scale and productivity is observed. This positive change can be attributed to the implementation of the DWS sub-component, though to a less extent and indirectly.
4. Involvement of HHs and their members in collection of water improved drastically (i.e. the time spent for collecting water decreased) and completely due to implementation of the DWS sub-component. This left its positive effect especially on women, who were mainly in charge for the water collection. Among other aspects of the positive impact the alternative labour cost should be mentioned. Beneficiaries saved time that can be used for income generation activities.
5. Increase of the volume of drinking water used by HHs of surveyed communities is significant. That is especially notable in case of the water used for irrigation of homestead lands. In a longer run, this will bring to better productivity and increased agricultural production. All the mentioned changes may be attributed to the implementation of the DWS sub-component almost completely.
6. Positive dynamics is obvious also in case of the number of diseases. Most of them were eliminated completely.

Implementation of the IA was possible only in 2 communities, where the rehabilitation of the DWS infrastructure was completed and handed-over for further exploitation. In this situation it is very hard to provide really applicable recommendations. The only major wish picked from the beneficiaries and forwarded to the RAED PIU and IFAD is the continuation of the interventions. Interventions may continue both vertically (additional investments in the same communities) and horizontally (involvement of new communities in future projects). Good examples of interventions are rehabilitation and (re)construction of drinking water collection ponds and pump stations, reconstruction of in-community supply networks, support for the installation of water-meters, capacity building for community based organizations that became responsible for effective exploitation of the DWS infrastructure, etc.

Major findings regarding the Component 2 (Rural Infrastructure) Pilot Projects (sanitation and solar heating systems) sub-component of the RACP include the following:

1. Effectiveness and Likelihood of Sustainability of implementation of pilot projects is assessed to be quite high. Despite most of them are not formally finished, most of them actually are. There is a good potential for replicability, examples of similar investments already happened.

Major findings regarding the Component 2 (Rural Infrastructure) Irrigation Water Supply sub-component of the RACP include the following:

1. Currently, only 3 communities can be formally assumed as having completed results of the IWS sub-component. All households in the area can benefit from newly reconstructed networks.
2. . The volume of required water delivered has increased substantially, number of HHs with secure access to water has tripled, capacity of the irrigation systems has significantly increased, losses have decreased to 10%.
3. 92% of beneficiaries of the RACP IWS sub-component registered increase of assets, but only part of that increase can be attributed to the RACP implementation, since major results did not happen, yet.
4. Income of the surveyed beneficiaries grew for 35%, but only part of that increase can be attributed to the RACP implementation, since major results did not happen, yet.
5. 53% of beneficiaries reported about a rise of the land value and estimated that increase to be 87%. This increase is substantially conditioned by the irrigation infrastructure rehabilitation.
6. Significant improvement in the capacity of the IWS systems. Significant decrease of losses happened; in most cases the losses were eliminated totally. Use of irrigation water grew for 21% on average.
7. Changes in the structure of community specific crops towards introduction of higher-value types just started. In addition, cultivation area for other crops increased also implementation of the RACP results.
8. Market accessibility features' improvement became notable. However, that is just start and it is too early to summarize the results; real impact will happen, yet.
9. The infrastructure is being reconstructed as planned and serves the water users in the respective area. The average area served by one WUA staff member is within the normal range to operate effectively. Collection rates both for water and membership fees are quite close to 100%. WUA representatives are mostly confident, WUAs have the necessary resources to sustainably serve their communities.
10. Extent of satisfaction among beneficiaries is very high. The great majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.

Implementation of the IA was possible only in a very limited number of communities where the rehabilitation of the IWS infrastructure was completed and handed-over for further exploitation. In this situation it is very hard to provide really applicable recommendations. The only major wish picked from the beneficiaries and forwarded to the RAED PIU and IFAD is the continuation of the interventions. Interventions may continue both vertically (additional investments in the same communities) and horizontally (involvement of new communities in future projects). Good examples of interventions are rehabilitation and (re)construction of secondary and tertiary (in-community) irrigation channels, investments in transforming the irrigation infrastructure into gravity systems, application of modern solutions (such as drip irrigation), etc.

2 INTRODUCTION

2.1 RACP BACKGROUND

2.1.1 General introduction

The Rural Assets Creation Programme (RACP) is a 5-year development initiative with about USD 52 million budget financed by IFAD, OFID, the Government of Denmark, the Government of Armenia (GoA), financial institutions and RACP clients.

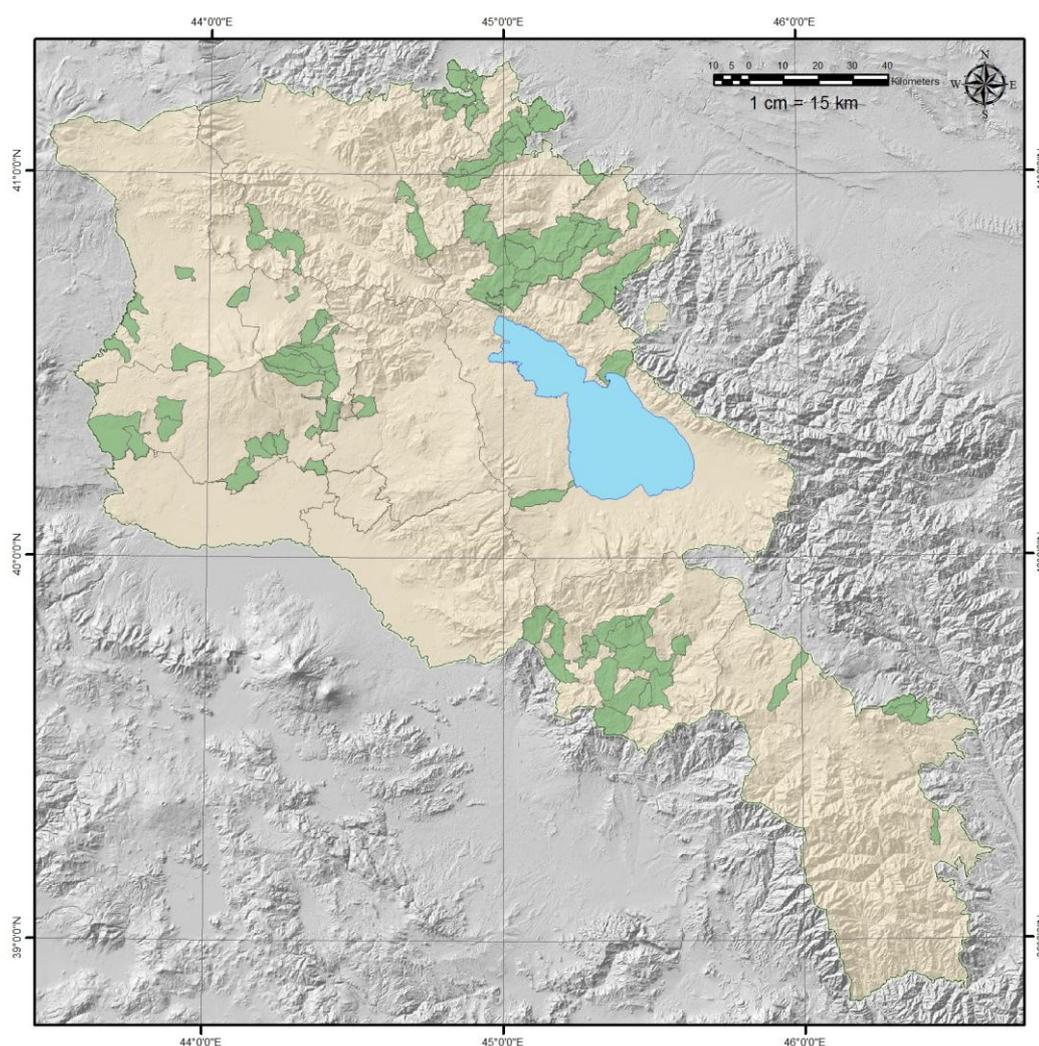
The overall goal of the RACP was **the reduction of rural poverty** by:

1. Establishing an economically viable fruits and nuts sector with backwards linkages to poor rural smallholders;
2. Establishing of the Fruit Armenia CJSC with 100% GoA share, which will be fully privatized for delivery of services to the fruits and nuts sector; and
3. Removing infrastructure bottlenecks that inhibit increasing participation of the economically active rural poor in enhanced commercialization of the rural economy.

The overall Programme goal and objectives were/are brought to life by the following components:

- ▶ Component 1: Support to Fruits and Nuts Sector;
- ▶ Component 2: Rural Infrastructure, and
- ▶ Component 3: Programme Management.

Map 1 - RACP implementation area



Programme target areas were Aragatsotn, Lori, Shirak, Vayots Dzor, Syunik, Gegharkunik, and Tavush marzes of the RA. The Component 1 have been implemented only in Tavush and Vayots Dzor Marzes and in selected sites of Aragatsotn Marz.

2.1.2 Programme Component 1 - Support to Fruits and Nut Sector (Fruit Armenia)

The first Component of the RACP was seeking to:

- (i) increase poor smallholder assets and incomes (...) by linking them to the Armenian fruit and nut value chains by using Fruit Armenia CJSC² as a vehicle for sector development; and
- (ii) improve the access of Armenia's horticultural produce to international markets through support to agro-related laboratories; export promotion; and training of poor smallholders not contracted by FA as well as private sector nurseries. The activities under the Component are articulated under the two sub-components.

Activities under the RACP Component 1 were implemented directly by Fruit Armenia CJSC. The main objective of FA is to earn profit and to support the overall RACP objective to stimulate economic development of rural areas. FA's responsible governing bodies were the Shareholders Meeting, Board of Directors (Board) and Managing Director (MD).

Sub-component 1.1: *Support to FA* was to implement a vertically integrated enterprise led approach to achieving profitable and sustainable modernization of the Armenian fruit and nut production that would specifically benefit smallholder farmers. FA was supposed to establish orchards under contract farming arrangements with smallholders, and process and market their produce. FA's nursery should have created domestic capacity to propagate modern varieties. This was intended to introduce modern technologies allowing improved production and productivity; create access to domestic and international markets through introduction of international standards (...) in cooperation with selected laboratories; and create a viable model for further sector development. However, in light of limited progress and obvious omissions in the design of the sub-component, the IFAD Supervision Mission of December 2014 recommended a *substantial reduction in the scope* of the sub-component, which would focus on the consolidation of the ongoing activities and elaborating an exit strategy.

Sub-component 1.2: *Promotion of Exports and Standards* was supposed to include the following activities:

- (i) support to agro-related laboratories;
- (ii) export promotion (...); and
- (iii) promotion of smallholders and nurseries operating outside the FA contracts.

Mainly for the same reasons mentioned above, and due to availability of other support programmes financing similar activities, the same Supervision Mission recommended to *cancel* this sub-component, and the Government of Armenia (GoA) followed up that advice. The RACP Sub-component 2 was skipped.

Operation and achievements of the Component 1 has been continuously criticized by the IFAD Supervision Missions from the very beginning of the Project implementation³. The *major* aspects causing the dissatisfaction of the supervision missions were the following:

1. Slow progress in launching the implementation from the very beginning: getting approvals from the GoA, formal establishment of FA, hiring of the management and professional personnel, conclusion of respective agreements, allocation of co-funding of the GoA, etc.
2. Slow and insufficient progress in selection of partnering farmers and land plots, conclusion of contracts with them, establishment of orchards. The planned areas for the establishment of orchards have been revised 3 times and every time towards decrease.

² This organization was established with the GoA Decree N1572-A as of November 3, 2011, although it was expected to be operational already in spring 2011. The only shareholder of the organization is the RA MoA.

³ See the annual Supervision Mission Reports for the period of 2012-2015

3. General management process, including operation and effectiveness of the Board of Directors, hiring of experts, submitting the procurement notices for approval, organizing procurement tenders, preparing documents, etc.

In the meantime, FA provides its own explanations for the registered shortcomings in achievement of the assigned results and objectives, including the following:

1. The major delay in the start of the Project implementation was conditioned by almost 8-month gap between the adoption of respective governmental bodies. Launching of the activities was substantially delayed also due to long selection of chief technical advisor conducted by the IFAD. FA could no way influence that processes.
2. Major problems of the implementation are sourcing from improper design of the Component 1 conducted by attracted international experts that were not sufficiently aware of local circumstances, including peculiarities of Armenian agricultural sector: availability of lands, selection of cluster lands, farmers' experience and mentality (low motivation and limited role), crops required and having potential, etc.
3. Absence of budget allocations for agricultural instruments and machines (making the works more complicated and time consuming), often problems with irrigation water supply and other operational issues.
4. IFAD's influence on the process of the provision of planting materials. The major accent should have been made on local production of young trees for the supply of the project and not only (other farmers, exports), while IFAD insisted on importing of young trees. Skipping of the establishment of tissue laboratory is the logical continuation and confirmation of this claim.
5. Long delays in provision of approvals for the procurement of various inputs, which were crucial for a rural development project, sometimes causing even losses of agricultural seasons.

The IA implementation team has neither a mandate, nor resources to intervene these relations, but finds it crucial to register the arguments of both sides. These ineffective relations had their "contribution" in non-achievement of the assigned results of the Project. All those arguments should be thoroughly analyzed by all parties in order to avoid similar shortcomings in future development initiatives.

2.1.3 Programme Component 2 - Rural Infrastructure

The Rural Infrastructure (RI) component of the RACP aimed at the need of continued public investments in order to:

- (i) improve livelihoods and economic growth in disadvantaged rural communities; and
- (ii) support the achievement of the full economic potential of the beneficiary clusters identified and supported under the RACP Component 1.

Respectively, implementation of the Component 2 consisted of two major interventions spheres:

- Sub-component 2.1 - Public Utilities Investments (PUI). This sub-component supported the construction or rehabilitation of village based public infrastructure facilities of *a) gas, b) drinking water, and c) other pilot projects*. Investment projects were conducted in 7 project marzes.
- Sub-component 2.2 - Value Chain Infrastructure (VCI). This sub-component was implemented for the construction and/or rehabilitation of irrigation water supply systems that complement and strengthen the Component 1 of the Project. However, the implementation of the sub-component was extended to the 7 marzes constituting the broader RACP RI Component target area (i.e. not focusing exclusively on Fruit Armenia JSC clusters). However, priority was given to investments in areas with good potential for orchards development.

In the beginning of the Project implementation the IFAD Supervisory Missions were not satisfied with the effectiveness and efficiency of the implementation of Component 2. The major reason for dissatisfaction was in delays in physical and financial progress. This situation continued steadily until 2014. It was noted that ongoing investments account only not a major part of the planned outreach of these investments appraisal target. Moreover, overwhelming majority of the performance was ensured through gas projects.

According to the IFAD Supervision Mission reports, investments in drinking water supply showed relatively lower cost/beneficiary compared to other types of PUI investments and provide equitable benefits for the youth, women, men and are effective in reaching the poor. This was one of the reasons for allocating the major part of incremental funds underused under the RACP component 1 to this sub-component. These investments aimed at ensuring safe and clean drinking water to people living in poor communities sharing common taps or having less than 6 hours of supply a day. Priority is given to networks serving as multiple use facilities, i.e. catering for human needs but also for livestock and vegetables production in the household plot. The design standard considers a demand of 150 l/person/day and fire-fighting requirements.

Irrigation water supply projects became the major target of the RACP VCI sub-component, when the Component 1 of the Project did not identify a major need for rehabilitation of transport infrastructure. The GoA has sent an amendment request to IFAD to open up the use of the RTI subcomponent for off-farm infrastructure in conjunction with FA investments, i.e. rehabilitation of irrigation water supply systems.

2.2 IMPACT ASSESSMENT OBJECTIVE

In view of the RACP and of the overall assessment of RACP achievements against Programme related documents' intended objectives, an impact assessment for the RACP has been planned. The objective of this assignment is **to define the status of project output, outcome and impact indicators against the indicators defined in the last version of the revised Logical Framework Matrix of the RACP. The scope of the current Impact Assessment (IA) focuses on assessing the status of a set of RACP indicators extracted from the updated Logical Framework Matrix (LFM) and the list of IFAD's Results and Impact Measurement System (RIMS) indicators.** These indicators are presented in detail in Inception Report.

2.3 IMPACT ASSESSMENT METHODOLOGY

The methodology of the IA implementation has been thoroughly discussed with the respective experts of the RAED and developed in close cooperation with them. Details of the methodological approach were presented in the Inception Report submitted to the RAED prior to the start of the IA activities. However, the following chapters will provide general snapshot to the methodological aspects applied.

2.3.1 Information Collection

Providing the great variety of the indicators suggested by the IA ToR, the necessary information has been collected from the following sources:

1. Respective documents and secondary materials related to the implementation of the RACP,
2. Specialists and invited experts (tentatively) of the RACP implementation team,
3. National/regional/local stakeholders and key informants,
4. Target groups and beneficiaries.

Some aspects of the IA were conducted based on information collected, cross-checked and justified from several sources. Other pieces of the IA based on just single source information. Different sources of information were addressed via different methods and survey instruments. Methods of information collection vary depending on the type of sources and on the nature of acquired information. In general, the following major methods were applied:

1. Desk review of the available information,
2. In-depth interviews with the stakeholders and specialists,
3. Structured semi-standard survey of beneficiaries sampled and selected from target locations.

Information collection tools were based on the initial wrap-up of the M&E indicators defined by the ToR. Different information collection tools (questionnaires) were applied for the collection of respective information from various sources. **In-depth interviews** were conducted via the application of semi-structured questionnaires consisting of mainly qualitative nature questions. However, these questionnaires have been used for the collection of both numeric data and qualitative insights on the subject matter. Before the main

interviews, respondents had been sent the framework of questions to be discussed during the meetings. After the in-person interviews, follow-up phone interviews were held to clarify questions and get further information as needed. The **survey of beneficiaries** was conducted via application of semi-standard questionnaire consisting of almost only closed-end questions.

2.3.2 Sampling

The sampling of information sources was applied only for the quantitative beneficiaries of the RACP components. 95% of Confidence Level and Confidence Interval of 10 was applied for ensuring the representativeness of the survey results. Based on the methodological approach presented above, the IA implementation team calculated the sample sizes for each group of beneficiaries, separately. The selection of the locations/communities is an important task for several good reasons. The most important reason is that sampled communities should have been representative for the project implementation geography in terms of concentration and reflection/inclusion of all regions/marzes. It was decided (as required by the RIMS and recommended in the IFAD's Supervision Mission Report⁴ to conduct the survey in only those locations, where the interventions were completed.

Table 1 - Sampling of the communities and respondents for the quantitative survey by the RACP sub-components

RACP sub-components	Total number of communities* (target)	Completed projects (actual)	Number of communities selected for the survey	Beneficiary survey sample size
Fruit Armenia	8	8	8	54
Natural gas supply	51	31	9	89
Drinking water supply	26	2	2	89
Sanitation and solar systems	7	0	0	0
Irrigation water supply	14	3	3	92
Total	106	44	22	324

* - Including duplicating projects, i.e. doubled interventions in the same location

No sampling was applied for the selection of stakeholders, experts, and key informants since their number was not big and all of them have been included in the survey. The list of selected respondents for the in-depth interviews is the following:

Table 2 - Stakeholder survey respondents

N	Organization	Respondents
1.	RAED PIU	▪ Monitoring and evaluation unit, legal division
2.	Armenian-Fruit CJSC	▪ General director, ▪ Regional representatives/coordinators in Tavush and Vayots Dzor regions.
3.	Gazprom Armenia CJSC (tentative)	Respective officials from the regional branches in Aragatsotn, Gegharkunik, Lori, Syunik, Tavush, Vayots Dzor. Though, in-depth interviews with these experts may be skipped since all the needed information may be obtained via secondary information materials.
4.	Armenian Water Sewerage Company CJSC (tentative)	Respective officials from the regional branch in Tavush region (where the drinking water projects were completed).
5.	Water Users Associations	Heads of WUAs in Gegharkunik and Vayots Dzor regions.
6.	Communities Municipalities	Mayors of selected/sampled communities where the quantitative surveying will be conducted.
7.	Heads of community based public entities	School director, physician of the ambulatory, director of the culture house, etc. Only few of them, mainly in regard of the implementation of the pilot projects.
8.	Local businesses	Owners and/or managers of identified businesses

⁴ The supervision Mission has been conducted in the period of 22 September - 2 October 2015

2.3.3 The IA Implementation Modalities

According to the IFAD RIMS, for measuring/ensuring that results are achieved, performance against stated objectives has to be continuously monitored. Major aspects to be addressed in this regard are the following:

- ▶ **Outputs:** tangible immediate results that are produced through the implementation of activities,
- ▶ **Outcomes:** short-term and medium-term effects of a project's outputs
- ▶ **Impact:** long-term positive and negative effects produced by a project.

Respectively, for the assessment of achievements of any project results a respective set of indicators was applied. Those indicators also can be differentiated by their nature: measuring the outputs, outcomes, or impact. On the content side, the indicators may reflect 5 major and cross-cutting aspects of the implemented project, i.e. the relevance, effectiveness, efficiency, impact, and sustainability. Cross-cutting aspects mainly relate to gender, environment, and similar issues.

The current IA mainly addresses the pillars of effectiveness, impact, and sustainability. The basis for the selection of the indicators (provided in the ToR of the assignment) was the IFAD RIMS, the revised LFM of the Project, and the actually applied monitoring system currently operated by the RAED PIU. In total, **approximately 90 different indicators and sub-indicators are being applied within the current IA.** Overwhelming majority of those indicators is of quantitative nature, i.e. have a numerical or percentage value.

2.3.4 Data analysis

RIMS 1st level indicators are calculated as follows: **% of design = Cumulative (actual) result / Appraisal target.** RIMS also suggests consideration of per year targets and results, but since the project does not require collecting of those data in the framework of this IA, only final targets and results are considered.

RIMS 2nd level indicators are assessed according to RIMS instructions **on a 1 to 6 scale**, with certain modification due to **data limitations**. Other numeric indicators, where possible, are calculated as the % change between baseline and actual values.

Data limitations faced during the evaluation include the following:

- Opposite to what was expected, WUAs and some other stakeholders/informants had no access to a unified digital database where all the information could be found. Pieces of information were gathered from random files on computers of various employees, by asking community representatives and other WUA/other entities' staff.
- Certain data expected to be clearly documented was not actually available in a documented format. The respondents had to come up with certain figures through discussions, sometimes applying qualitative judgment.
- Collecting baseline data during the end-of-project IA undermines data reliability as certain numbers from 2010 were not easily available and were figured out through discussions and subjective judgment.
- For many indicators the end-of-project data is not available yet (such as crop yields, water used, etc.), and instead, expert estimates/predictions were used. However, the current IA based on predicted and not yet reached results shall be dealt with caution. In many cases, those predictions based on achievements of the most recent period, i.e. the year of 2015, which is not fully representative due to negative natural and climatic circumstances.
- Predictions for crop and other data were based on weather conditions, socio-economic situation and other factors, which complicated the possibility of attributing certain results or changes in indicator values to the Programme activities.

3 ARMENIA: DYNAMICS OF MAJOR SOCIO-ECONOMIC INDICATORS IN 2010-2016

Macroeconomic indicators. Part of indicators specified by the ToR of the current assignment cannot be attributed to any of evaluation pillars and rather relate to general socio-economic situation and its' change in Armenia. Assessment of those indicators will not make any sense without proper bases for comparison. That is why; it was decided to present some indicators on macroeconomic and social situation in the country in dynamics. The following major indicators are suggested to comprise the comparison base.

Table 3 - Macroeconomic indicators

Macroeconomic indicators	Measurement unit	2015 ¹⁾	2010 ²⁾	Change
Gross domestic product (GDP)				
Total GDP	million AMD	5,032,089	3,460,203	45%
- of which agriculture	million AMD	868,976	588,205	48%
GDP per capita	AMD	1,674,795	1,062,683	58%
External trade				
Export of products (in FOB prices)	million USD	1,487	1,041	43%
- of which food products	million USD	390	171	128%
Import of products (in FOB prices)	million USD	2,753	3,162	-13%
Balance of external trade (in FOB prices)	million USD	-1,266	-2,121	-40%
State budget				
Incomes and official transfers	million AMD	1,147,178	780,439	47%
Expenditures	million AMD	1,378,377	954,317	44%
Deficit	million AMD	-231,199	-173,878	33%
State external debt				
State external debt	million USD	4,317	3,299	31%
RA state external debt compared with GDP	%	41%	36%	14%
Inflation				
Inflation compared with the previous year	%	3.7%	8.2%	-55%
USD exchange rate				
USD exchange rate (average of period)	AMD	477.92	373.66	28%

¹⁾ Source: "Food security and poverty, January-March 2016", NSS 2016

²⁾ Source: "Food security and poverty, January-December 2012", NSS 2013

Conclusions on the macroeconomic development in Armenia are rather ambiguous. Despite nominal reported (formal) GDP growth, the situation did not develop in a best way. GDP per capita is very low compared to many other countries, the State budget deficit and the State debt grew substantially, dependence on imported consumer products increased, substantial part of GDP growth has been "swallowed" by the inflation and increase of the exchange rate. Drastic jump of the exchange rate happened in December 2014, when devaluation of national currency for 20%-30% consequently struck prices of (especially imported) products and inputs. That is why, the decrease of inflation rate is somehow artificial.

(ID35). Nominal consumer expenditures of rural household (monthly average) (USD). (ID36). Structure of nominal consumer expenditures of rural households (monthly average) (USD). The baseline data on nominal consumer expenditure amount and its composition as of 2010 is available, but not for 2016. The freshest information available is for the 2014. The usefulness of that information in the context of the current assignment is somewhat questionable, but that is the only available data. In addition, the indicators are available on the national level, i.e. no assessment is possible on the targeted communities (and even Marzes) level. Finally, the indicator is defined for rural households, but actually available information is of more general nature and relates to whole population, without any further specification for rural inhabitants. Regretfully, there is no better source of information to be applied for the current assessment.

Table 4 - Nominal consumer expenditures per household

Types of consumer expenditures	2014 ¹⁾		2010 ²⁾		Change	
	(ID35)	(ID36)	(ID35)	(ID36)	(ID35)	(ID36)
	Monthly average, AMD	Structure, %	Monthly average, AMD	Structure, %	Monthly average, AMD	Structure, %
Food purchased	51,693	35.6%	42,633	39.1%	9,060	21%
Food not purchased	12,540	8.6%	12,189	11.2%	351	3%
Public catering	2,143	1.5%	1,721	1.6%	422	25%
Alcoholic beverages	867	0.6%	1,036	0.9%	-169	-16%
Tobacco	5,002	3.4%	3,843	3.5%	1,159	30%
Non-food products	26,507	18.3%	16,859	15.5%	9,648	57%
Services	46,464	32.0%	30,834	28.3%	15,630	51%
National average	145,216	100.0%	109,115	100.0%	36,101	33%

¹⁾ Source: "Food security and poverty, January-March 2016", NSS 2016

²⁾ Source: "Food security and poverty, January-December 2012", NSS 2013

Official sources of information state that monetary expenses for the consumption of almost all products increased in 2014 in comparison to 2010. Providing general trends in Armenian economy, it can be assumed that tendency of that growth continued in the following 2 years, too. In the meantime, it should be noted that expenses grew in AMD, which devaluated quite substantially. In other equal conditions, this may bring to a conclusion on reduction of consumption volumes for some products.

(ID37). Average annual per capita consumption of main types of food (USD). The last statement of the previous paragraph is being confirmed by other piece of formal statistical information. At first site, there may be an impression that changes in the consumption structure may have happened towards replacement of lower value products by those of higher value. In the meantime, it is noted that major positive change was registered only one product that is not of the highest importance.

Table 5 - Average annual per capita consumption of main types of food

Main types of food	Measurement unit	2014 ¹⁾	2010 ²⁾	Change
Bread and bakery products	kg	135.7	142.4	-4.7%
Potatoes	kg	40.2	46.4	-13.4%
Vegetables	kg	77.2	68.6	12.5%
Fruit and berries	kg	46.1	51.1	-9.8%
Sugar	kg	6.4	7.2	-11.1%
Vegetable oil	liter	6.2	3.8	63.2%
Meat and meat products	kg	23.2	21.1	10.0%
Cheese of all types	kg	9.6	9.5	1.1%
Milk and matsun	liter	20.0	19.8	1.0%
Butter	kg	1.8	1.9	-5.3%
Eggs	pieces	130.6	132.8	-1.7%
Fish and fish products	kg	2.0	1.7	17.6%

¹⁾ Source: "Food security and poverty, January-March 2016", NSS 2016

²⁾ Source: "Food security and poverty, January-December 2012", NSS 2013

Deeper look at presented official figures may result in a conclusion about growing poverty. In the best scenario, consumption of all types of products should have increased, and growth trend for higher value products should be more notable. But the actual situation is largely different, and some high value products were consumed more due to being produced internally, within rural households.

Poverty and extreme poverty incidence by types of settlement. Official statistics report quite low poverty incidence in Armenia. However, a number of independent surveys and assessments funded/conducted by

various respectful organizations state the opposite. The same is attested by the IA team based on previous experience of conducting similar surveys.

Table 6 - Poverty and extreme poverty incidence by types of settlement

	2014 ¹⁾	2010 ²⁾	Change
Poverty incidence	30.0%	35.8%	-16%
- of which extreme poverty incidence	2.3%	3.0%	-23%
Poverty incidence in urban settlement	30.0%	35.7%	-16%
- of which extreme poverty incidence	2.4%	4.1%	-41%
Poverty incidence in rural settlement	29.9%	36.0%	-17%
- of which extreme poverty incidence	2.0%	1.1%	82%

¹⁾ Source: "Food security and poverty, January-March 2016", NSS 2016

²⁾ Source: "Food security and poverty, January-December 2012", NSS 2013

Poverty incidence by marzes and Yerevan city. The following table reveals the difference in poverty incidence level in various regions of Armenia.

Table 7 - Poverty incidence by marzes and Yerevan city

Marzes	2014 ¹⁾		2010 ²⁾		Change	
	Poor	of which extremely poor	Poor	of which extremely poor	Poor	Extremely poor
Total in Armenia	30.0%	2.3%	35.8%	3.0%	-16%	-23%
- Yerevan	25.2%	2.0%	27.1%	2.2%	-7%	-9%
- Aragatsotn	18.7%	0.5%	28.9%	2.8%	-35%	-82%
- Ararat	28.5%	1.6%	42.4%	2.9%	-33%	-45%
- Armavir	29.0%	2.9%	33.0%	1.4%	-12%	107%
- Gegharkunik	32.3%	2.1%	43.6%	1.4%	-26%	50%
- Lori	36.4%	3.0%	45.9%	5.2%	-21%	-42%
- Kotayk	37.2%	2.9%	46.8%	5.8%	-21%	-50%
- Shirak	44.2%	3.8%	48.3%	5.0%	-8%	-24%
- Syunik	24.2%	1.0%	26.8%	1.7%	-10%	-41%
- Vayots Dzor	18.2%	0.6%	37.1%	2.2%	-51%	-73%
- Tavush	30.6%	2.7%	26.1%	1.2%	17%	125%

¹⁾ Source: "Food security and poverty, January-March 2016", NSS 2016

²⁾ Source: "Food security and poverty, January-December 2012", NSS 2013

Major explanation of the discrepancy and doubtful nature of information on poverty incidence is explained by the political nature of that information. The extent of poverty is among the most important indicators for the assessment of the work of the State, and official statistics may be somewhat biased. In the meantime, we should comprehend that official statistics provides generalized information, while the current IA addressed only several communities having all pre-conditions for being extremely poor: they are remote, bordering, (partly to not a friendly neighbor), mountainous, with small opportunities of non-farm income generation, etc.

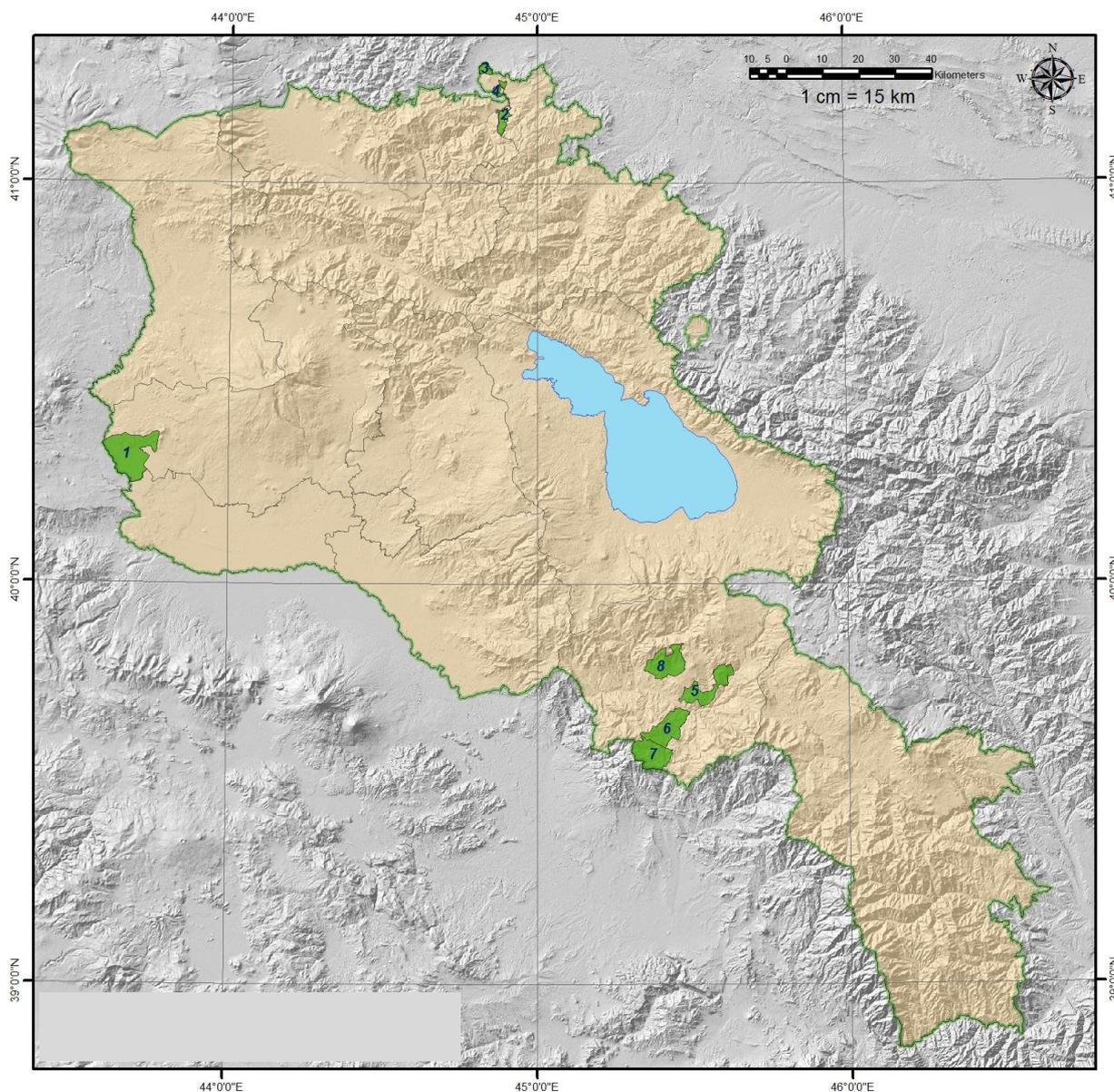
4 RACP RESULTS: COMPONENT 1 (FRUIT ARMENIA)

The Terms of Reference of the current IA specified sophisticated list of indicators for the measurement of results and objectives assigned for being achieved via implementation of the RACP Component 1. The whole list of indicators was segregated by their belonging to a certain pillar of evaluation complemented with several pieces of additional information conditionally grouped under the title of “General” indicators. It is noteworthy that scope of the IA does not address the relevance and efficiency of the Project (implementation), but concentrate on remaining pillars.

4.1 EFFECTIVENESS

(ID5). Land of smallholder farmers put under fruits/nut production (Ha). Implementation of the RACP Component 1 by FA has been implemented in 8 communities of 3 marzes of Armenia.

Map 2 - FA component implementation area



Details of the results achieved within the component are presented below.

Table 8 - Land of smallholder farmers put under fruits/nut production, Ha

Marz	Community	Types of fruits/nuts							Number of beneficiaries
		Walnut	Plum	Peach	Peach nectar	Cherry	Sweet cherry	Total	
Aragatsotn	1. Aragatsavan					14.16	2.40	16.56	10
Tavush	2. Archis			0.95	2.95			3.91	13
	3. Debedavan		4.95		1.78			6.73	16
	4. Ptghavan	4.13					8.14	12.27	4
Vayots Dzor	5. Arin	16.79						16.79	21
	6. Azatek	2.22	7.79	2.99		6.49		19.49	11
	7. Khndzorut						5.40	5.40	28
	8. Vernashen						4.00	4.00	18
Total		23.14	12.74	3.94	4.73	20.65	19.94	85.15	121

Obviously, the achieved results of FA are far from the targeted figures - establishment of 305 ha of orchards, less than 28% of the target was achieved. The reasons for that are different and have been thoroughly addressed in Supervision Missions Reports, communication with FA, and other documents. However, the major reasons for such failure of achieving the assigned results have been the following: 1) wrong/unjustified/untested design of the component, 2) inefficient management of the component, and 3) ineffective control over the implementation of the component from the side of all counterparts that as per PDR, Financing agreement and other related documents are entitled to direct the project and make decisions and impose their implementation.

(ID6). A business plan detailing operations of FA until 2028 developed by 2016 (Number). The FA presented a Business Plan for FA prepared on 2012. FA specifically noted that this document was prepared by consultants selected by the IFAD, but ultimately was not approved. Quick review of the document allows making one major judgments in regard of the document - a brief document that might address some aspects (such as the current situation in the market, risks, competition) better. Further review of FA related documents revealed that this Business Plan never became a guiding document for FA, none of objectives assigned by the Business Plan was achieved (even approximately). **It was fully unrealistic document.**

(ID7). Fruit Armenia consolidated by 2016. The IFAD Supervision Mission conducted in 2014 recommended to consolidate the operations of FA. It was formally registered that “FA has constrained management resources and meets with difficulties in the recruitment of qualified staff, a severe risk for operations. *FA should not expand its operations beyond the 80 ha of orchards* currently committed to. Rather, FA should focus to maximize the profitability of these orchards to optimize the cash flow, and explore means to outsource orchard management and marketing.” FA followed the first part of the recommendation, but other recommended aspects were mainly skipped. It was decided to dissolve/liquidate this organization following the recommendations of so called exit strategies to be addressed below. However, providing the period of the IA implementation, status of the affairs in FA, and timing required for the “consolidation” it may be concluded that **it would be hardly possible to finish that process before June 30, 2016.**

(ID10). Fruit Armenia breaks even in 2020. (ID11). Secured bridge financing between 2016-2019. These indicators should rather be skipped. As mentioned, FA is planned to be liquidated and **both indicators become invalid.** Exit strategies assume some aspects of attracting external financing for further operation of orchards, but this is just a theoretical statement on the paper may ultimately no at all relate to bridge financing issues.

(ID12). Agreed exit strategies with contracted smallholder farmers in 2016. Development of so called “exit strategies” is another recommendation of the IFAD Supervision Mission 2014. The mission in 2015 noted that those strategies have been prepared with the support of attracted consultants and discussed in the GoA. However, the final decision on selection of a certain option is yet pending. Rapid review of the document titled “Re-scoping Fruit Armenia: (...)” identified the following major shortcoming that the IA implementation team wants the IFAD and RAED to pay attention to the following aspect. The document addresses the reasons of

low-performance of FA very briefly. Moreover, it rather concentrates on the fact that orchards have been ultimately established and are operational (though the survey of FA beneficiaries identified major problems and complaints in this regard, too). **Avoiding the analysis of root reasons and making respective conclusions, skipping pointing out real shortcomings and officials responsible for them, will not make possible developing and suggesting effective exit strategies. The risk of facing the same/similar problems and full failure of the Project (dilution of investments in orchards) becomes very high.**

(ID13). Outsourcing agreements signed with private sector companies in 2016 (Number). Progress in this direction was formally first addressed in the IFAD Supervision Mission Report for 2014. In particular, it was noted that expected cooperation with private sector was not initiated as of that moment. Moreover, possibility of that cooperation was questioned due to the limited remaining time until Programme completion. In the same document the mission recommended that FA management to start and enhance cooperation with different private sector organizations on the topics of sales and marketing. However, **almost no measure has been conducted in this regard, no formal outsourcing took place.**

(ID76). Trainings received (including but not limited to marketing, agro-processing, improved agricultural practices; business and financial planning), (availability, type, purpose) (Type/number).

(ID77). People trained in crop production practices and technologies (Number of trainees, disaggregated by gender). According to information provided by the FA management, trainings were organized only on the topic of proper treatment/cultivation of newly established orchards in all 3 Marzes of the FA implementation. Trainings have been by invited international experts/horticulturists⁵, in the period of March-May 2015. In total 137 farmers participated in those trainings⁶.

(ID80). Outreach of Programme information dissemination campaigns (Number of HHs reached by information campaigns). Information dissemination on implementation of the FA component was conducted via meetings with Governors of 3 Marzes, respective officials of Governorates, Mayors of selected communities and officials of Municipalities, and farmers of selected communities. Regretfully, **the process of information dissemination campaigns was not documented. It is impossible to estimate the number of actually addressed farmers.**

4.2 IMPACT

(ID1). Number of rural people living on < USD 4.30/day (Percent). It is important to specify that this indicator was calculated on the basis of living expenditures (only livelihood expenses, i.e. investment and business expenditures excluded) reported by beneficiaries. This also includes in-kind consumption of own agricultural produce, i.e. cash and non-cash income of HHs. The following table introduces absolute number of such people and their households, as well as their share in total number of surveyed respondents. Inclusion of the number of households is another recommendation of the IFAD RIMS.

Table 9 - Number of rural people living on less than \$4.30 per day

	Households	People
Total number of surveyed respondents	54	239
Number of people living for less than \$4.3 per day	32	165
Share of people living for less than \$4.3 per day in total	59.3%	69.0%

The share of HHs and population living for less than \$4.3 per day is very high and disturbing, though a special reservation can be made - beneficiary respondents usually tend to exaggerate the negative aspects of their livelihood. However, this could serve an additional justification for targeting those communities and HHs for the implementation of the component, since these people really need support. Moreover, following the general trends, a reasonable conclusion can be made that poverty level increased in the recent period and the positive impact of the FA component implementation (despite its scale) is very much expected.

⁵ Sebastian Linard and Harold Van Den Bogard

⁶ As per information formally submitted to the IA team by the FA

(ID2). Increase of household asset ownership in communities benefiting from RACP activities (Percent). 91% of beneficiaries of the RACP FA component registered increase of assets (in type, quantity, or value). In order to conduct the measurement of change, the assets of beneficiaries may be conditionally divided into 2 groups: business (agricultural land, domestic animals, agricultural machinery, etc.) and household (house, passenger car, furniture, etc.) assets.

Table 10 - Increase of household asset ownership

Types of assets	Own the assets	Procured the assets in the recent 5 years	Procurement value, \$ ⁷	Average procurement value per 1HH, \$
	A	B (= % in A)	C	D
Land plot	100%	4%	2,374	1,187
Cattle, sheep and goats, pigs	74%	18%	4,956	708
Beehives	33%	11%	514	257
Cowshed	87%	6%	1,101	367
Agricultural machinery	17%	11%	88	88
Vehicle	19%	10%	3,182	3,182
Greenhouse	6%	67%	1,052	526
House	100%	6%	87,127	29,042
Passenger car	59%	50%	84,104	5,257
Furniture	98%	38%	15,154	758
TV set	100%	22%	7,024	585
Washing machine	96%	62%	14,116	441
Refrigerator	100%	39%	12,915	615
Water heater	54%	59%	4,648	273
Heating system	35%	37%	8,676	1,239
Gas stove / oven	89%	15%	1,811	259
Other	2%	0%	0	0
Total			248,842	4,608

89% of beneficiaries registered increase of household assets vs. 24% of households that registered increase in business assets. The most frequently procured household assets were washing machines, water heaters (and heating systems), refrigerators, and cars. In case of business assets, the most often met assets were various domestic animals. Interestingly, investments in business infrastructure became observable (such as investments in cowshed, machinery, greenhouses, etc.). **Average increase of the value of (all) assets per beneficiary in the period of 2010-2016 comprised \$4,608** (according to the respondents' estimation/valuation (based on actual procurement prices) of their assets).

(ID38). Household Assets Ownership Index of targeted population (*Percentage (to be reported as share of targeted households with improvement in household asset ownership, disaggregated by male and female headed households)*). Some assumptions should be made on definition/identification of man or woman headed HH. In most of HHs decisions are being made mutually, by man and woman ruling the HH. In the meantime, the situation is not always as simple as that. There were situations where final decisions would be made by men, if they were available. This is very common situation in villages having intensive work migration of male population. Thus, the survey resulted in an important finding that shares of man and woman headed HHs are very close to each other, with a slight prevalence (of few per cents) towards the first group.

⁷ Respondents mentioned prices in AMD. For converting into USD the IA implementation team applied the exchange rate of \$1=408.6 AMD, which was calculated to be the average value for the period of 2010-2016

Table 11 - Households with improvement in household asset ownership

	Household Assets Ownership Index		
	Total Assets	Business Assets	Household Assets
Share of HHs that registered any increase of assets in 2010-2016, o.w.	90.7%	24.1%	88.9%
- In male headed HHs	91.9%	27.0%	89.2%
- In female headed HHs	88.2%	17.6%	88.2%

The only major finding related to the increase of assets is that in growth of business assets is more notable in men-headed HHs. This is rather legitimate; men are more tend to and ready for hard investments than women.

(ID3). Increase in income for target households participating in the Programme activities (Percent).

None of surveyed households had comprehensive information on the size of their income. The reasoning of such negative finding is the following:

- There is no practice/culture/habit of keeping records on income among surveyed households. That is why, the figures they tell are usually approximate and incomplete. People tend to forget Irregular (one time) and small income. Bigger than usual (also one-time/irregular) income they prefer not to mention, at all. In both cases the information they provide is being distorted.
- Information about agricultural income is also incomplete and approximated. Part of agricultural produce is being consumed within the households for subsistence purposes. Most of farmers does not equal/identify that consumption as income. Some produce is being sold, including the barter, which is not being evaluated in monetary means, either. Finally, a certain quantity of agricultural products is being processed for further sales or consumption; farmers tend to skip that volume, too.

On contrary, people used to be more cautious while talking about expenses, thus, the provided information is more accurate. In such cases, it is widely accepted to justify the value of income indirectly, via application of the amount of expenses. The basic (rough) assumption is that amount of income plus savings should at least total to the amount of expenses. This method was applied also for the justification of the information provided by respondents; the justified amount was included under the row of "Other sources".

Table 12 - Size and structure of beneficiary households' income

	Income					
	After RACP (2016)		Before RACP (2010)		Change	
	USD	Share	USD	Share	USD	%
Total income of surveyed beneficiary households, including proceeds from:	503,449	100%	393,860	100%	109,589	28%
- Income from the Fruit Armenia component	10,533	2%	0	0%	10,533	-
- Agriculture	131,937	26%	137,082	35%	-5,145	-4%
- Work remuneration	151,779	30%	98,032	25%	53,747	55%
- Self-employment	14,391	3%	11,943	3%	2,447	20%
- Dividend	1,713	0%	0	0%	1,713	-
- Rent of assets by others	1,175	0%	1,175	0%	0	0%
- Work migration of household member	15,051	3%	19,090	5%	-4,038	-21%
- Relatives and friends	13,417	3%	8,786	2%	4,630	53%
- Pensions and allowances	50,301	10%	35,918	9%	14,383	40%
- Other sources	113,153	22%	81,834	21%	31,319	38%

In the period of RACP implementation, overall income of FA component beneficiaries' households grew for 28%. However, the reasons of that change are almost not related to the implementation of the Project. Some farmers that provided their lands to the FA received compensations, others were involved in paid works. In total, the amount farmers obtained from the cooperation with the FA is not big. Thus, the change in surveyed HHs' income almost cannot be attributed to the Project.

Table 13 - Increase in income

	Income, USD			Increase in income
	After RACP (2016)	Before RACP (2010)	Change	
Total income of surveyed households	503,449	393,860	109,589	28%
Average income per household	9,323	7,294	2,029	

In the meantime, not all the surveyed households registered increase in income in the period of 2010-2016. Actual increase is registered only with 78% of surveyed households, while in case of remaining 22% there was a decrease of income. However, again, these changes are not anyhow related to the implementation of the Project and FA component.

Table 14 - Change in income

	Change in income			
	Increase	No change	Decrease	Total
Share of beneficiaries	78%	0%	22%	100%
Amount of change	126,833	0	-17,244	109,589
Change per household, \$	3,020	0	-1,437	2,029

(ID4). Increase in the value of land put under orchards (USD/ha). Total area of orchards established by the FA component comprised 85.15ha. **All orchards have been established on arable lands.** However, the formal purpose of use of those lands was not changed to “perennial crops”, so far. This can be done only when the orchards will become 5-years old.

Information about the change of land value for the orchards established by the FA is just an estimation. According to Mayors of surveyed communities and regional representatives of the FA, almost no sales/procurement of lands is being made in their communities, to serve as basis for more objective judgments and comparison. However, everybody agrees on increased value of lands. Land values presented below refer to young (newly planted) orchards, as in case of the orchards established by the FA. It is assumed that value of “older” orchards is higher and the value of the FA orchards are yet to grow.

Table 15 - Increase in the value of land put under orchards

Community	Area of orchards established by the FA, ha	Value of land put under orchards, \$/Ha			
		After RACP (2016)	Before RACP (2010)	Change	
				\$/Ha	%
Aragatsotn					
1. Aragatsavan	16.56	6,000	3,000	3,000	100%
Tavush					
2. Archis	3.91	10,000	1,500	8,500	567%
3. Debedavan	6.73	10,000	2,500	7,500	300%
4. Ptghavan	12.27	10,000	2,500	7,500	300%
Vayots Dzor					
5. Arin	16.79	5,000	1,000	4,000	400%
6. Azatek	19.49	3,000	1,000	2,000	200%
7. Khndzorut	5.40	2,000	1,000	1,000	100%
8. Vernashen	4.00	13,000	10,000	3,000	30%

Based on the information presented above it can be calculated that value of orchards established by the FA grew for 162%. The total increase of value comprised \$349,000 as of June 2016, or \$4,098 per ha of established orchards. In the meantime, it is important to mention that major increase was ensured mainly by increase of land value in 3 communities of Tavush Marz.

(ID33). Household Incomes by gender (cash and non-cash, including but not limited to income from agriculture, livestock, employment, etc. (USD/annual average). Traditional specificities of Armenian reality should be taken into account for the segregation of HH income by gender. Some part of HHs' income is being generated **by personal activities of HHs' certain members**. That type of income can be attributed to a certain person and segregated by gender. Examples of such income generation activities are remuneration for permanent or temporary employment, self-employment, pensions, etc.

The other part of the HHs' income is being generated via **collective activities of several or all members of HHs**. The best example is the agricultural activity. Income generated via agriculture is impossible to separate among and attribute to HH members; there is no sufficient basis and objective information for that. Thus, if the engagement of a certain member of the HH can be specified as personal activity, than the income generated by that person can be fully attributed to him/her, i.e. segregate the income by gender. If it is not possible, the income cannot be attributed. The table below presents surveyed HHs members' income generated via different types of occupation in economic activities and explanations for segregation of those proceeds by gender.

Table 16 - Possibility of income segregation by gender of HHs members

Occupation / Source of income	Possibility of income segregation by gender
Agricultural activities	Segregation is not possible, since several/all members of the HHs are usually being involved in such activities, though to a different extent. Income generated via agricultural activities belongs to everybody in the HH. The only objective factor to base the segregation of the income on is the time spent by each member of the HH on those activities. However, that is impossible to estimate, too; nobody ever measured the time spent by any member of the HH. Moreover, in different periods/years involvement of every certain member of the HH can be different. Thus, the measurement of the income generated by every member of the HH is assessed to be impossible.
Permanent employment	Clearly segregated by gender
Temporary (seasonal) employment	Clearly segregated by gender
Permanent self-employment	Clearly segregated by gender
Temporary (seasonal) self-employment	Clearly segregated by gender
Unemployed, looking for job	Unemployed people looking for job actually do not generate income, thus this indicator is not applicable for them.
Student	Though students do not work, they generate income in a form of educational allowances. That income is being clearly segregated by gender.
Pensioner	Clearly segregated by gender
Disabled	Disabled people receive pensions and allowances. That income is being clearly segregated by gender.
Housekeeper	Housekeepers usually do not work and do not generate income. Thus this indicator is not applicable for them.
Other	HHs may have income from a number of different sources, e.g. remittances, financial support from friends and relatives, interest received from deposits, etc. In all these cases, as in case of agriculture, the income cannot be segregated.

Thus, income generated in HHs can be obtained mainly from the sources presented in the table above. The survey of the FA component beneficiaries revealed that 42% of respondents HHs members are engaged in one of income generation occupations. Male members of the surveyed HHs ensure 70% of total income generated; respectively the share of income generated by female members comprises 30%.

Table 17 - Household Incomes by gender

	Total number of HH members	Of which, having own (personal) income		Total amount of income, \$/annual*	Per capita income, \$/annual
		Person	%		
Male	125	60	48%	121,638	2,027
Female	114	41	36%	53,002	1,293
Total	239	101	42% (weighted average)	174,639	1,729 (weighted average)

* - Information was collected in AMD. Conversion was made at the average exchange rate for 2016 - \$1=480 AMD, since this is about current income

(ID34). Household expenditures by type (USD/annual average). Size and structure of household expenditures may provide a lot of information about the livelihood standards of surveyed HHs. The higher is their income level, the bigger and more sophisticated is the consumption size and structure. Normally, poorer HHs spend more (proportionally in total income) on everyday needs (food, clothing, utilities), while more secured HHs allocate more funds (again proportionally) for other purposes (entertainment, travel, investments in business, etc.) In the meantime, there are some local specificities that should be necessarily taken into account in the Armenian context. Some of them are the following:

- Armenians relation to education - every Armenian family prefers to cut all expenses, but ensure education of children,
- Demographic situation in remote villages - prevalence of elder people that causes healthcare expenditures and such costs are absolutely non-elastic,
- “Innovations” - in the recent period of 5 years relatively new expenditure rows appeared in the budgets of local HHs, such as gas (due to new installation of pipelines), internet, insurance of cars/vehicles, traffic rules violation fees, etc.,
- Demand for sophisticated items of consumption (such as travel, leisure in abroad, expensive household items, regular participation in cultural events, etc.) is traditionally low.

Table 18 - Household expenditures by type

Expenditures	Expenditures, \$				Change	
	After RACP (2016)		Before RACP (2010)		\$	%
	Total	Per 1HH	Total	Per 1HH	Per 1HH	
Total	419,246	7,764	322,763	5,977	1,787	30%
▪ Livelihood expenses	376,618	6,974	280,493	5,194	1,780	34%
- Food	95,198	1,763	87,423	1,619	144	9%
- Clothing and shoe	27,521	510	24,136	447	63	14%
- Electricity	17,457	323	12,910	239	84	35%
- Gas	10,284	190	9,289	172	18	11%
- Fuel-wood	7,753	144	4,944	92	52	57%
- Drinking water	595	11	567	10	1	5%
- Phone and internet	16,024	297	8,889	165	132	80%
- Public transport	8,293	154	8,131	151	3	2%
- Fuel for own car	20,667	383	14,843	275	108	39%
- Education	19,941	369	23,256	431	-61	-14%
- Healthcare	22,414	415	17,696	328	87	27%
- Other household expenses	18,640	345	15,117	280	65	23%
- Leisure and entertainment	5,906	109	5,385	100	10	10%
- Travel	5,825	108	3,084	57	51	89%
- House maintenance and repair	17,489	324	9,753	181	143	79%
- Car maintenance and repair	16,258	301	8,189	152	149	99%
- Asset tax, insurance, fees	7,353	136	3,614	67	69	103%
- Loan principal and interest	43,735	810	10,296	191	619	325%
- Events	13,820	256	11,795	218	38	17%
- Other	1,444	27	1,175	22	5	23%
▪ Business costs for self-employment	2,888	53	563	10	43	413%
▪ Agricultural activities' costs	39,740	736	41,707	772	-36	-5%
- Land cultivation costs	27,717	513	32,506	602	-89	-15%
- Animal husbandry costs	12,023	223	9,201	170	52	31%

Increase in the amount of almost all expenditures is obvious. The major reason for this is the inflation - prices of all products and services should have increased and did. Average annual inflation rate in Armenia in the recent period of 5 years varied around 5-7% despite several cases of unexpected and critical jumps (as it

happened in December 2014). The second reason is, however, the change in surveyed HHs livelihood. The biggest changes in the structure of expenditures were conditioned with the following:

1. **Loan repayments.** The number of rural HHs lending money from financial institutions grew significantly in the recent years. Moreover, farmers started attracting loans from several institutions, use sophisticated financial products, capitalizing interests, etc. It is very hard to provide unambiguous estimates to this phenomenon, but in its majority it can be assessed as positive. Farmers normally attract loans only in case if they believe in possibility and ability of repaying.
2. **Asset taxes, insurance, and fees. Phone and internet.** Newly appeared expenditures have already been addressed. Several years ago, a new regulation was adopted making the insurance of transportation means mandatory. This caused at least \$50-100 additional expense for any HH having a passenger car. The same costs for vehicles and agricultural machinery and vehicles are even higher. Similarly, internet became an undividable part of livelihood in every community of Armenia and it happened in the recent several years.
3. **Cars and houses maintenance and repair.** These costs are conditioned with old age and obsolete conditions of transportation means and houses in remote rural communities. The older are assets, the bigger are costs for their repair.

(ID44). Land under production adopting modern technologies (Ha). Application of modern technologies and innovations has been one of the major objectives of the FA component. Innovative approach was incorporated into the design of all sub-components and activities. Regrettably, application of modern technologies became reality to a very limited extent and in a very narrow scope.

Table 19 - Land under production adopting modern technologies

Community	Modern technologies							
	New sorts		Drip irrigation		Intensive agriculture			
					Pruning		Mechanical cultivation, healing	
	Ha	%	Ha	%	Ha	%	Ha	%
Aragatsotn								
1. Aragatsavan	16.56	100%	0	0%	16.56	100%	0	0%
Tavush								
2. Archis	3.91	100%	3.91	100%	3.91	100%	3.91	100%
3. Debedavan	6.73	100%	0	0%	6.73	100%	6.73	100%
4. Ptghavan	12.27	100%	0	0%	12.27	100%	12.27	100%
Vayots Dzor								
5. Arin	16.79	100%	0	0%	16.79	100%	0	0%
6. Azatek	19.49	100%	0	0%	8.71	45%	0	0%
7. Khndzorut	5.40	100%	0	0%	5.40	100%	0	0%
8. Vernashen	4.00	100%	0	0%	4.00	100%	0	0%
Total	85.15	100%	3.91	5%	74.37	87%	22.91	27%

The only major form of application of modern technologies was the use of special (i.e. new) sorts of young plants. Installation of drip irrigation systems and anti-hail nets were assumed to be the major types of modern technologies to be applied within the FA component. The first option was applied for a very small part of established orchards, and the second measure was skipped fully. Reasoning the IA team received from various sources was different: the implementation team argued about insufficient budget and impediments from the side of the IFAD. The IFAD Supervision Missions Reports blame the FA management for being ineffective in this issue.

(ID48). Value of the land by category (USD/ha by category). Assessment of the value of the land in the areas of the FA component intervention is very difficult due to total absence of market operations. In fact, no lands of this type have been sold/procured in those communities to create real precedent and basis for judgment. That is why, the only option left for the IA implementation team is to rely on subjective judgments of local stakeholders.

Table 20 - Value of the land by category

Community	Value of the land by category, \$/Ha					Change in recent 5 years
	Arable land	Perennial plots		Meadows	Pastures	
		Orchards	Vineyards			
Aragatsotn						
1. Aragatsavan	2,000	3,000-10,000	7,000	4,000	167	0%
Tavush						
2. Archis	1,000	10,000	6,000	Do not know, no precedent	Do not know, no precedent	0%
3. Debedavan	2,500	7,500	10,000	Do not know, no precedent	900	+20%
4. Ptghavan	1,000-3,000	6,000-7,000	3,000-5,000	1,000	Do not know, no precedent	+15%
Vayots Dzor						
5. Arin	1,250	5,000	Do not have	Do not know, no precedent	73	0%
6. Azatek	1,750	3,000	Do not have	Do not know, no precedent	Do not know, no precedent	+75%
7. Khndzorut	1,200	1,500	Do not have	350	Do not know, no precedent	+15%
8. Vernashen	7,000	12,000	15,000	Do not know, no precedent	Do not know, no precedent	-20%

In general, prices for orchards vary substantially and depend on various factors, with the age of trees as decisive factor. Younger orchards usually cost cheaper, while fully productive orchards (with 5-15 years old trees) are more expensive. Prices for different crops' orchards vary substantially. The most expensive land plots are apricot orchards that cost \$10,000 per ha. Orchards of apple and plum are cheaper. Orchards (especially vineyards) cost specifically higher in communities where different processing factories (say - wineries) operate. This situation was registered particularly in Debedavan and Vernashen.

Prices for land in Ptghavan depend on their category and availability/form of irrigation (system/type). Land plots supplied by the gravity irrigation water are more demanded and higher valued. Lands irrigated by water supplied by pumps have less value since they are difficult/expensive to cultivate.

(ID49). Community specific main Crop structure (Type/Ha); (ID50). Gross harvest and yield of community specific main crops (Tone per crop/ha). Before the start of the RACP implementation a reasonable supposition was made that implementation of the FA project will substantially contribute to the change the profile of agricultural activities in targeted communities. The FA example should have become replicable. Lands previously used for cultivation of low-value crops should have been further used already for higher-value crops' (such as fruits, grapes, some vegetables, and other) cultivation. However, the change expected from the very beginning of the RACP implementation did not happen, the scale of activities decreased many times. Dynamics of communities' specific main crops are presented in [Table 21](#).

General dynamics of cultivation areas in targeted communities is positive. In total, the area cultivated in 2016 exceeds the territory cultivated in 2010 for more than 650 ha. Quite importantly, there is increase in cultivation area of high value crops of about 140 ha, 85 of which is ensured through the FA. Decreases in cultivation area appeared mostly on areas used for cultivation of low value crops. The volume of harvest remained almost the same, although the harvest of high value crops decreased notably. This particularly took place due to replacement of old peach orchards in Archis and Ptghavan. Presumably, positive changes in the volume of fruits' harvest may be expected within a few coming years, once newly planted trees will become fully productive.

Table 21 - Community specific main (Top 5) crop

a) Area, Ha

Community		Wheat	Barley	Corn	Sunflower	Potatoes	Apple	Pear	Apricot	Peach	Plum	Nuts	Grape	Alfalfa	Other	Total
1. Aragatsavan	After RACP (2016)	280	460						300				124	1,110	406	2,680
	Before RACP (2010)	200	300						250				124	1,200	401	2,475
	Change	40%	53%						20%				0%	-8%	1%	8%
2. Archis	After RACP (2016)		125	35	20					39			49		116	384
	Before RACP (2010)		66	3	5					75			49		131	329
	Change		89%	1067%	300%					-48%			0%		-11%	17%
3. Debedavan	After RACP (2016)	90	40	70	39								60		116	415
	Before RACP (2010)	44	56	9	100								60		79	348
	Change	105%	-29%	678%	-61%								0%		47%	19%
4. Ptghavan	After RACP (2016)	170	60		20					40			30		105	425
	Before RACP (2010)	85	30		100					40			30		30	315
	Change	100%	100%		-80%					0%			0%		250%	35%
5. Arin	After RACP (2016)	20	90						30		20			55	28	243
	Before RACP (2010)	30	60						15		15			48	17	185
	Change	-33%	50%						100%		33%			15%	65%	31%
6. Azatek	After RACP (2016)	75	60				20	12	15						85	267
	Before RACP (2010)	65	50				20	12	15						65	227
	Change	15%	20%				0%	0%	0%						31%	18%
7. Khndzorut	After RACP (2016)		78			10	15	8						54	39	204
	Before RACP (2010)		40			10	15	8						22	30	125
	Change		95%			0%	0%	0%						145%	30%	63%
8. Vernashen	After RACP (2016)	15					25		30			15	60	A	18	163
	Before RACP (2010)	15					15		15			15	52	A	14	126
	Change	0%					67%		100%			0%	15%	-	29%	29%
Total	After RACP (2016)	650	913	105	79	10	60	20	375	79	20	15	323	1219	913	4,781
	Before RACP (2010)	439	602	12	205	10	50	20	295	115	15	15	315	1270	767	4,130
	Change	48%	52%	775%	-61%	0%	20%	0%	27%	-31%	33%	0%	3%	-4%	19%	16%

A – Vernashen community harvested grass from 500 ha in 2015

b) Gross harvest, Tone

Community		Wheat	Barley	Corn	Sunflower	Potatoes	Apple	Pear	Apricot	Peach	Plum	Nuts	Grape	Alfalfa
1. Aragatsavan	After RACP (2016)	700	1,150						6,000				868	8,880
	Before RACP (2010)	400	600						3,750				496	9,600
	Change	75%	92%						60%				75%	-8%
2. Archis	After RACP (2016)		516	252	20					3			478	
	Before RACP (2010)		88	17	10					170			455	
	Change		488%	1414%	108%					-98%			5%	
3. Debedavan	After RACP (2016)	288	128	513	70								900	
	Before RACP (2010)	80	84	84	90								750	
	Change	260%	52%	511%	-22%								20%	
4. Ptghavan	After RACP (2016)	544	180		16					320			525	
	Before RACP (2010)	255	75		150					480			360	
	Change	113%	140%		-89%					-33%			46%	
5. Arin	After RACP (2016)	30	135						750		40			600
	Before RACP (2010)	45	96						375		15			288
	Change	-33%	41%						100%		167%			108%
6. Azatek	After RACP (2016)	180	144				200	120	90					
	Before RACP (2010)	130	100				100	72	90					
	Change	38%	44%				100%	67%	0%					
7. Khndzorut	After RACP (2016)		78			154	225	160						324
	Before RACP (2010)		52			150	225	160						132
	Change		50%			3%	0%	0%						145%
8. Vernashen	After RACP (2016)	15							300			0	1,200	
	Before RACP (2010)	15							90			150	200	
	Change	0%							233%			-100%	499%	
Total	After RACP (2016)	1,757	2,331	765	106	154	425	280	7,140	323	40	0	3,971	9,804
	Before RACP (2010)	925	1,095	101	250	150	325	232	4,305	650	15	150	2,261	10,020
	Change	90%	113%	660%	-57%	3%	31%	21%	66%	-50%	167%	-100%	76%	-2%

c) Yield, Tone per crop/ha

Community		Wheat	Barley	Corn	Sunflower	Potatoes	Apple	Pear	Apricot	Peach	Plum	Nuts	Grape	Alfalfa
1. Aragatsavan	After RACP (2016)	2.50	2.50						20.00				7.00	8.00
	Before RACP (2010)	2.00	2.00						15.00				4.00	8.00
	Change	25%	25%						33%				75%	0%
2. Archis	After RACP (2016)		4.13	7.20	1.00					0.07			9.76	
	Before RACP (2010)		1.33	5.55	1.92					2.27			9.28	
	Change		211%	30%	-48%					-97%			5%	
3. Debedavan	After RACP (2016)	3.20	3.20	7.33	1.80								15.00	
	Before RACP (2010)	1.82	1.50	9.33	0.90								12.50	
	Change	76%	113%	-21%	100%								20%	
4. Ptghavan	After RACP (2016)	3.20	3.00		0.80					8.00			17.50	
	Before RACP (2010)	3.00	2.50		1.50					12.00			12.00	
	Change	7%	20%		-47%					-33%			46%	
5. Arin	After RACP (2016)	1.50	1.50						25.00		2.00			10.91
	Before RACP (2010)	1.50	1.60						25.00		1.00			6.00
	Change	0%	-6%						0%		100%			82%
6. Azatek	After RACP (2016)	2.40	2.40				10.00	10.00	6.00					
	Before RACP (2010)	2.00	2.00				5.00	6.00	6.00					
	Change	20%	20%				100%	67%	0%					
7. Khndzorut	After RACP (2016)		1.00			15.38	15.00	20.00						6.00
	Before RACP (2010)		1.30			15.00	15.00	20.00						6.00
	Change		-23%			3%	0%	0%						0%
8. Vernashen	After RACP (2016)	1.00				2.00			10.00			0.00	20.00	
	Before RACP (2010)	1.00				2.00			6.00			10.00	3.85	
	Change	0%				0%			67%			-100%	419%	
Total	After RACP (2016)	2.70	2.55	7.29	1.34	15.38	7.08	14.00	19.04	4.09	2.00	0.00	12.29	8.04
	Before RACP (2010)	2.11	1.82	8.39	1.22	15.00	6.50	11.60	14.59	5.65	1.00	10.00	7.18	7.89
	Change	28%	40%	-13%	10%	3%	9%	21%	30%	-28%	100%	-100%	71%	2%

(ID51). Production income by type (cash and non-cash) (USD/annual average). Orchards established by the FA are not of productive age, yet. The only community, where the component received its first yield is Archis village of Tavush Marz. 3.91 ha peach (including nectarine) orchards established in this community provided about 7 tons of yield in 2015 (1.8 tone/ha productivity). This yield was sold for the price of 174 AMD/kg, and total sales comprised almost \$2,500. However, the presented figures are not at all representative for the whole program, this is rather a very small and experimental volume of marketed product. Real volumes of yield from 85 ha established orchards will/should be harvested in 2-3 years the earliest.

Table 22 – Sales of crops harvested from the FA orchards in 2015

	Quantity, kg	Sales price, AMD/kg	Value	
			AMD	USD
Peach, o.w.				
- 3 rd category (big size)	840	250	210,000	438
- 2 nd category (medium size)	1,480	200	296,000	617
- 1 st category (small size)	1,730	100	173,000	360
Peach-nectar, o.w.				
- 2 nd category (medium size)	2,340	200	468,000	975
- 1 st category (small size)	470	100	47,000	98
Total	6,860	174	1,194,000	2,488

(ID52). Production expenses by type (USD/annual average). Costs presented below relate to primary production of crops, only. They do not contain such expenses as overheads of the FA, promotional costs, depreciation, etc. This means that presented picture is somewhat incomplete, but it is at least basing on the actual and reliable figures provided by experts of the FA in regions.

Table 23 - Production expenses: Peach and Peach-nectarine⁸

Community	Archis (Tavush Marz)
Orchard	Peach and peach-nectarine
Area	1 ha
Number of trees	1,600 trees/ha
Labour costs	4,000 AMD/man/day

Costs	Value		Explanation
	AMD/annual	USD/annual	
Pruning	160,000	333	Labour cost: for 1 tree` 100 AMD
Collection and removal of branches after pruning	12,000	25	Labour cost: 3 man/day
Chemicals	196,500	409	
Healing with machinery	60,000	125	Agricultural machinery services 4 times/year
Tree inter-row area cultivation	60,000	125	Agricultural machinery services 3 times/year
Tree inter-trunk cultivation	48,000	100	Labour costs: 3 times x 4 man/day
Irrigation water cost	70,000	146	
Irrigation labour	88,000	183	Labour costs: July-August - 2 times x 7 man/day May - June: 2 times x 2 man/day
Harvest	28,072	58	Labour costs: 1 man/day= 250 kg (yield) Total yield - 6,860 kg from 3.91 ha
Autumn irrigation preparations	91,429	190	Labour costs: 1 man/day= 70 trees
Stone collection	16,000	33	Labour costs: 2 times x 2 man/day
Fertilization	0	0	Fertilization will start from the moment of orchard becoming productive (2016)
Total	830,000	1,729	

⁸ Source: regional representatives of the FA

Table 24 - Production expenses: Other Stone Fruits⁹

Costs	Walnut		Plum		Cherry		Sweet Cherry	
	AMD / annual	USD / annual						
Community Area	Arin		Azatek		Aragatsavan		Khndzorut	
Area	1 ha		1 ha		1 ha		1 ha	
Number of trees	200 tree/ha		1,500 tree/ha		1,000 tree/ha		500 tree/ha	
Labour costs	5,000 man/day		5,000 man/day		5,000 man/day		5,000 man/day	
Hoeing and tilling the soil around the trees	40,000	83	-	-	-	-	-	-
Cleaning-removal of dry grass	20,000	42	20,000	42	50,000	104	20,000	42
Manual inter trunk weeding	-	-	-	-	200,000	417	-	-
Inter row weeding with machinery	-	-	-	-	16,000	33	-	-
Fertilization: Inputs	30,240	63	-	-	30,000	63	-	-
Fertilization: Labour costs	10,000	21	-	-	50,000	104	-	-
Pruning	2,000	4	15,000	31	20,000	42	5,040	11
Chemicals	6,000	13	6,000	13	-	-	6,000	13
Healing manually	45,000	94	45,000	94	-	-	30,000	63
Irrigation water cost	13,200	28	49,585	103	360,000*	750	15,000	31
Irrigation with machinery (April)	-	-	135,000	281	-	-	-	-
Irrigation: labour cost	135,000	281	275,000	573	120,000	250	120,000	250
Grass harvest	25,000	52	25,000	52	-	-	40,000	83
Autumn hoeing and tilling the soil around the trees	20,000	42	-	-	100,000	208	-	-
Guarding	100,000	208	100,000	208	-	-	-	-
Total	446,440	931	670,585	1,397	946,000	1,971	236,040	493

* - There is no gravity irrigation, costs include also expenses of pump station

As the tables above suggest, there are notable differences in amounts of the same expenses for different crops/orchards. Those differences are conditioned with the following factors:

- Different number of trees on 1 ha for various crops,
- Different age of orchards,
- Differences in irrigation systems (gravity vs. pumped),
- Different extent of the use of machinery in cultivation of orchards.

4.3 SUSTAINABILITY

(ID87). Crop production groups formed/ strengthened (Number). (ID89). Marketing groups formed/strengthened (Number/Male/female). According to information provided by the FA, a Farmers' Group (FG) was established in each of targeted communities. This FG, in cooperation with regional agronomist, was supposed to coordinate and control the process of agricultural works in orchards. In the meantime, those FGs were "established" in the very beginning of the process and were involved only in production issues; no other issues (such as marketing) have been discussed or addressed. In the meantime, none of those groups actually sustained. None of them have been formally registered or undertook formal responsibilities.

(ID88). People trained in post-production, processing and marketing (Male/female). No training on post-production, processing, and marketing issues and themes took place. This is partially legitimate, since the FA component just reached to the production phase. No significant volume of yield was harvested and no need for marketing appeared, so far.

(ID90). Likelihood of sustainability of crop production groups formed/strengthened (Changes in # of members; # of meetings held; cost recovery). The IA implementation team did not find any evidence for

⁹ Source: regional representatives of the FA

the current existence of groups in communities targeted by the FA. None farmers mentioned about any regular meetings, self-organization and institutionalization, and recovery of any costs. Moreover, providing the general ideology of the FA component implementation the IA doubts in relevance of using this indicator for the FA.

4.4 OTHER ISSUES

(ID26). People/HHs in target area (Number). Total number of HHs in the targeted 8 communities of the FA component implementation comprises 3,290, and the number of population is 11,366 persons. Distribution of those figures by communities is presented below.

Table 25 - People/HHs in target area

Community	HH ¹⁾	Popula-tion ²⁾	Community	HH ¹⁾	Popula-tion ²⁾	Community	HH ¹⁾	Popula-tion ²⁾
Aragatsotn			Tavush			Vayots Dzor		
1. Aragatsavan	1,335	6,145	2. Archis	387	1,122	5. Arin	103	343
			3. Debedavan	267	605	6. Azatek	171	566
			4. Ptghavan	308	829	7. Khndzorut	168	449
						8. Vernashen	551	1,307

¹⁾ Source: 4-year development plans of respective Governorates and communities

²⁾ Source: "Marzes and Yerevan city of the Republic of Armenia in figures, 2015", NSS 2015 (number of de-jure population of January 1, 2015)

(ID27). Average HH size (Number). Size of HHs in the target area is a very important indicator that not only describes the social status and composition of beneficiaries' families, but is also being used in calculation of many other important indicators, such as per capita income and expenditures. Good ground for comparisons may serve the average figures for HH members in Armenia that varies around the coefficient of 4 persons per HH.

Table 26 - Average HH size

Number of HH members	HHs		Total number of HH members, persons	Average number of HH members, person/HH
	Number	Share		
1 person	3	6%	3	
2 persons	12	22%	24	
3 persons	5	9%	15	↓
4 persons	8	15%	32	
5 persons	8	15%	40	↓
6 persons	9	17%	54	
7 persons	6	11%	42	
8 persons	1	2%	8	↓
9 persons	0	0%	0	
10 persons	1	2%	10	
11 persons	1	2%	11	
Total	54	100%	239	4.43

The average number of HH members in surveyed communities is quite similar to the average figure for Armenia. In the surveyed sample the HHs consisting of 2 members (mainly aged couple) and 4-6 members (middle age parents with 2-4 children) (47% of total number of HHs) prevail.

(ID28). Age (Classification into categories) and (ID29). Gender (Male/female). Information on age distribution of surveyed HHs members is largely self-explanatory. Just one important conclusion can be derived: slightly less than a half of the surveyed HHs members are in the workable age of 20-60 years old.

This means that there is no (and is not expected) lack of productive workforce to exploit the constructed/rehabilitated infrastructure.

Table 27 - Age

HH members age groups	Total number of HH members	
	Person	Share
0-4	16	6.7%
5-9	13	5.4%
10-14	13	5.4%
15-19	9	3.8%
20-24	22	9.2%
25-29	27	11.3%
30-34	20	8.4%
35-39	7	2.9%
40-44	8	3.3%

HH members age groups	Total number of HH members	
	Person	Share
45-49	11	0.8%
50-54	18	3.8%
55-59	29	6.7%
60-64	18	3.8%
65-69	8	2.1%
70-74	3	0.8%
75-79	8	0.8%
80+	9	1.3%
Total	239	100.0%

The survey of beneficiaries HHs revealed that share of male population slightly prevails. From the viewpoint of income generation this does not mean anything; currently most of women are equally engaged in economic activities as men. Moreover, usually they take also housekeeping responsibilities over the income generation activities. Interestingly, this information does not reflect the permanent situation in surveyed communities. In the period of March-November a notable part of male population used to leave their HHs for the work migration.

Figure 1 - Gender

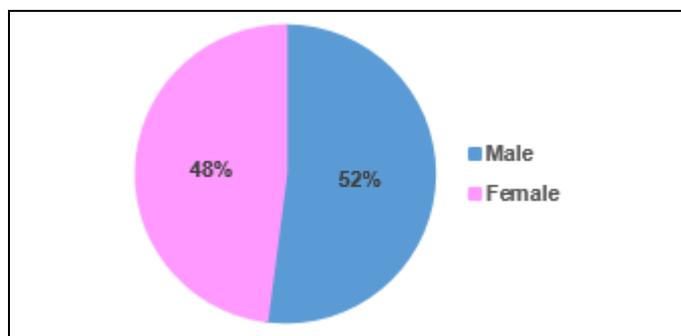
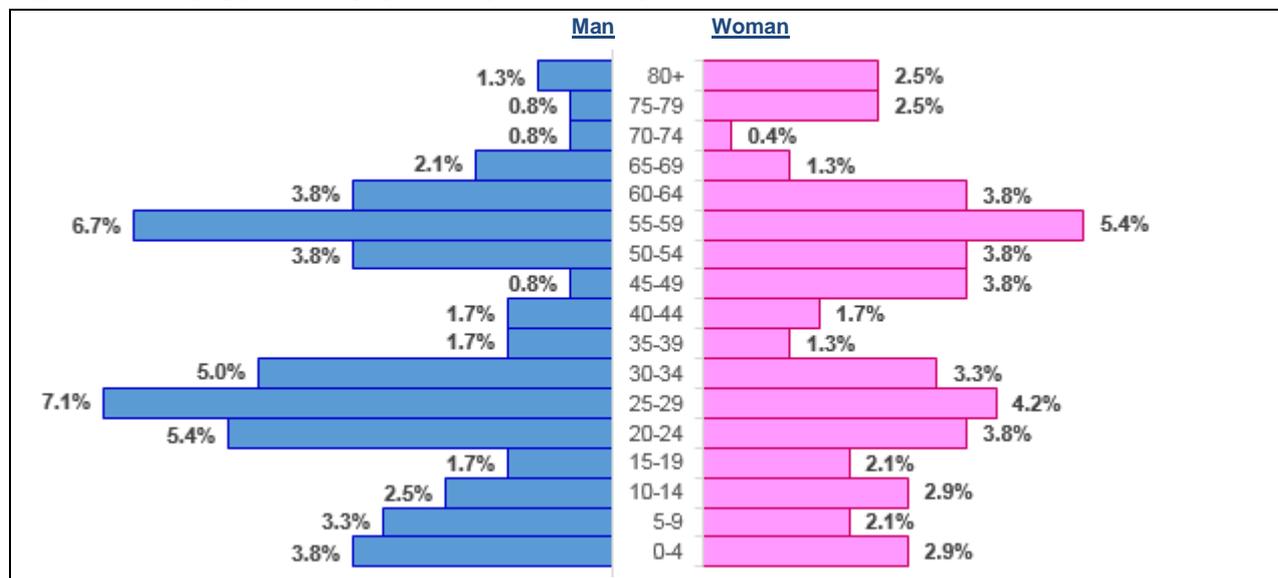


Figure 2 - The age pyramid of population (HH members)



Correlation and combination of age and gender information of the surveyed HHs members results in quite interesting findings. For some age groups there is a slight prevalence of male population upon the female population. This phenomenon is especially notable for the lower age groups. For the elder age groups (e.g. above 75) the situation is vice versa. The situation may be partially explained by negative developments of gender control measures applied widely in Armenia in the recent period.

(ID30). Education level (Classification into categories). As it was already mentioned the total number of 54 surveyed HHs members comprised 239 persons, including 191 adults (80%). Distribution of adult population by education levels is the following (see [Table 28](#)). The only major finding is that share of surveyed population having some professional qualification comprises 53% in total number of adults.

(ID31). Marital status (Classification into categories). As it was already mentioned the total number of 54 surveyed HHs members comprised 239 persons, including 191 adults (80%). Distribution of adult population by marital status is the following (see [Table 29](#)).

(ID32). Occupation (Classification into categories). As it was already mentioned the total number of 54 surveyed HHs members comprised 239 persons, including 191 adults (80%). Distribution of adult population by occupation is the following (see [Table 30](#)). The principle of data calculation is the following: *if the HH member is engaged in 2 workplaces (generates income from 2 different sources), the “higher/preferable” status of occupation is being registered.* For example, if the HH member is a student and, simultaneously, works as a taxi driver, his occupation is being registered as permanent or temporary employment. Or, if the HH member is a pensioner, but also works at his/her barberry shop as hairdresser, then his/her status is being registered as temporarily or permanently self-employed.

(ID73). Women groups in target area (Number). (ID74). Youth groups in target area (Number). (ID75). Indigenous people inhabiting in target area (Number). The following table presented the availability of special groups of people in the targeted communities of the FA component implementation.

Table 31 - Women and youth groups and indigenous people in target area, 2016

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
Aragatsotn						
1. Aragatsavan	0	0	1	30	100	400
Tavush						
2. Archis	1	20	0	0	0	12
3. Debedavan	0	0	0	0	6	10

Table 28 - Education level

Education level	Share in the number of HHs' adults
Elementary or no education (0-3 classes)	3%
Main (4-8 classes)	6%
Secondary (9-10 classes)	38%
Vocational	26%
University	27%
Total	100%

Table 29 - Marital status

Marital status	Share in the number of HHs' adults
Married	68%
Single	21%
Divorced	0%
Widow(er)	10%
Total	100%

Table 30 - Occupation

Occupation	Share in the number of HHs' adults
Agriculture	23%
Permanent employment	28%
Temporary (seasonal) employment	5%
Permanent self-employment	2%
Temporary (seasonal) self-employment	6%
Unemployed, looking for job	4%
Student	5%
Pensioner	13%
Disabled	1%
Housekeeper	14%
Other	0%
Total	100%

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
4. Ptghavan	0	0	0	0	18	0
Vayots Dzor						
5. Arin	0	0	0	0	0	0
6. Azatek	1	33	0	0	0	20
7. Vernashen	0	0	0	0	0	20
8. Khndzorut	1	8	1	34	0	0
Total	3	61	2	64	124	462

The following clarifications should be provided to the information presented above:

1. Active Women Union of Archis was established by the Green Lane NGO¹⁰ with the purpose of launching berries' production, though they not doing anything now;
2. Consumption Association of Women of Azatek is engaged in operation of greenhouse and cold-store facility;
3. SDA supported Women Group implements cattle and chicken breeding projects in Khndzorut.

(ID78). Active service providers/donor organizations/ engaged in the communities (Number/scope of works). International and local development organizations are quite active in Armenia. Development initiatives largely target remote, bordering, and poor communities of Armenian regions, including many communities targeted by the RACP, too. Development initiatives are being funded and implemented by not only institutional specialized entities, but also various individuals and businesses. Availability of such initiatives in targeted communities and type of their intervention is presented below.

Table 32 - Development organizations and their programs in targeted communities (FA component)

Community	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)
Aragatsotn			
1. Aragatsavan	ENPARD Establishment of dried food producers' cooperative. Provision of necessary equipment.	CARD Establishment of Veterinary and Artificial Insemination Service Center	
Tavush			
2. Archis			
3. Debedavan			
4. Ptghavan	ASIF School repair	Government of France Kindergarten reconstruction	UNDP Construction of irrigation network for homestead lands
Vayots Dzor			
5. Arin	SDA Pasture watering		
6. Azatek	OXFAM Establishment of cold storage	SDA Establishment of Veterinary Service Center	
7. Vernashen	APIU, SDA, OXFAM Pasture watering, construction of veterinary room		
8. Khndzorut	SDA Veterinary project	The Last Saints Union Construction of drinking water network	ASIF Reconstruction of the municipality building

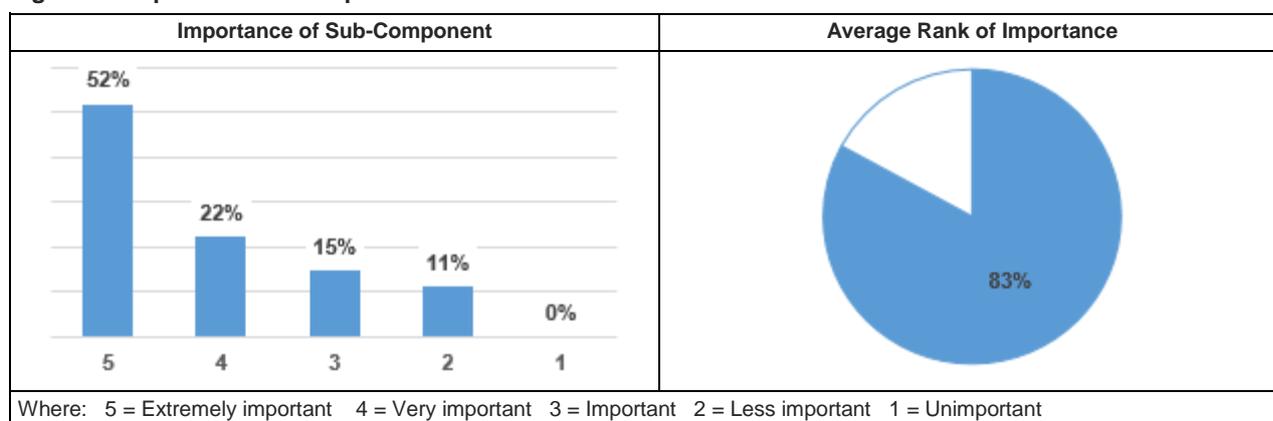
¹⁰ This NGO specializes in sustainable agriculture promotion activities

The table above bases on information collected immediately from the municipalities and Governorates of respective regions, but does not cover all issues related to development initiatives. Some important notes include:

- Many development organizations implement their activities (also for specific communities) from Yerevan or capitals of regions. For example, World Vision is very active in all regions of Armenia through its ADPs, but may not have presence exactly in a certain village, but target the whole region.
- Many projects have been completed and representatives of communities simply did not mention them.
- Local beneficiaries and stakeholders tend to forget about development initiatives of “soft” nature, such as trainings and other capacity building. But many organizations provide exactly such support.

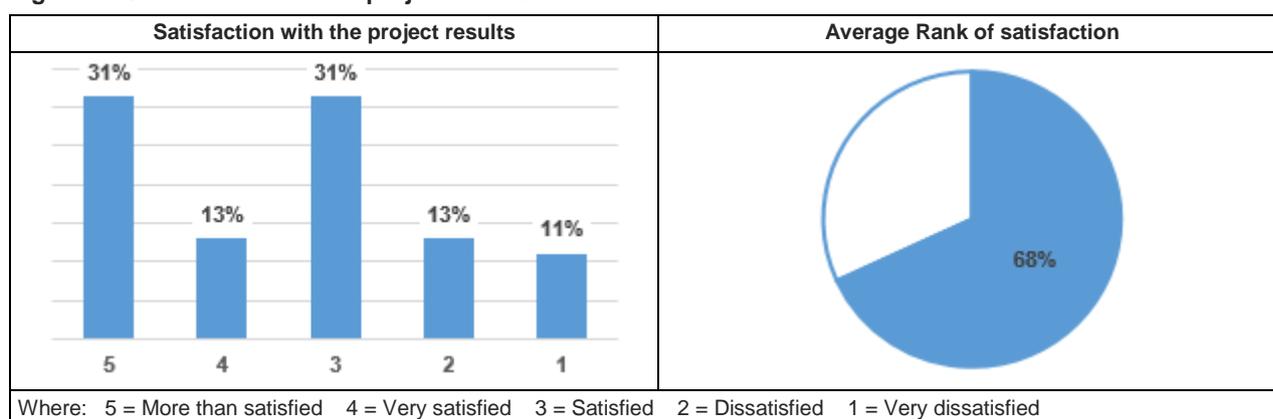
Importance of sub-components. Importance of the FA component was not included in the list of indicators initially provided in the ToR of the current IA. However, it was added during the discussions in the preparatory stage. Majority of respondents (74%) ranked the inclusion of the FA component in the list of RACP activities as very important and extremely important.

Figure 3 - Importance of Component



Satisfaction with the FA component implementation results. Assessment of the beneficiaries’ overall impression and satisfaction with the results of the development interventions is always a challenging task. The biggest problem is in different interpretation of the attitude and practical impossibility of objective benchmarking. In such situations, the evaluators are left with the only option of relying on subjective feelings and attitude of respondents.

Figure 4 - Satisfaction with the project results



24% of surveyed respondents of the FA component specified the reasons of their dissatisfaction with the results of the implementation of the component. In particular, dissatisfied farmers mentioned the following:

- ▶ Orchards are not protected from the hail and seriously lack irrigation;
- ▶ Orchards are not protected, animals damage the trees, half of area is not being irrigated, irrigation is not sufficient. Initially, there were plans to fence the orchard, apply drip irrigation, construct a security post, but none of those plans became true. Newly planted trees became virgin, people got dissatisfied.

- ▶ Some people regret for agreeing to provide their orchards. Initially, they were expecting to receive a compensation that would be used for buying fodder for animals. Later, they were informed that compensations were skipped. Generally, so called disappointed “beneficiaries” are more interested in their compensation amount of 100,000 AMD than in sustaining of orchards.
- ▶ Beneficiaries concluded contract, which specifies works to be done on their land plots. Very few activities have been completed. Notable part of trees got dried, there is no guard, nobody looks after the orchard.
- ▶ Beneficiaries are dissatisfied with the quality of young trees. They are too small for 3-year old trees and do not grow properly. There is no proper treatment in the orchards.
- ▶ Beneficiaries were promised to get compensations, but did not receive. Some of them worked and were supposed to be paid, but did not receive anything.

4.5 WRAP-UP CONCLUSION

The following conclusions can be made from the analyses presented above:

1. FA followed the recommendation of the IFAD Supervision Mission of 2015 and limited the establishment of orchards with 85 ha vs. planned 305 ha. However, the major reasons for such failure of achieving the assigned results have been the following: a) wrong/unjustified/untested design of the component, b) inefficient management of the component, and c) ineffective control over the implementation of the component from the side of all counterparts.
2. Overwhelming majority of the Effectiveness indicators (preparation of strategies and other documents, conclusion of contracts, etc.) was not achieved as of the RACP IA implementation moment.
3. 91% of beneficiaries of the RACP FA component registered increase of assets. Other indicators suggested for the measurement of Impact also grew. However, almost none of those increase (with major exception of the value of land used for establishment of orchards), can be attributed to implementation of the component. The change is significant - 100% - 560%.
4. Application of modern technologies (meaning drip irrigation, anti-hail nets, etc.) happened to a very limited extent - only in one community, on a small area.
5. Community specific crop structure changed positively. New, areas for cultivation of high-value crops grew for about 140 ha, 85 of which is ensured through the FA.
6. Intensive establishment of orchards started in 2013 and continued till 2015. Most of orchards were not of productive age as of the IA implementation moment. I.e. the productivity and yield figures were assessed for just 2015, which is not representative for the whole component. It is too early to make conclusions about the long-term results and impact of the FA component.
7. The sustainability of the results of the FA component implementation is seriously threatened. In some locations, where proper cultivation is being implemented the results will definitely sustain, providing that proper Exit strategies will be developed, agreed and applied for transferring the orchards to their ultimate owners. However, that pre-condition was not ensured as of the IA implementation moment.

The following recommendations are made for the less painful closure of FA component and learning lessons:

- Urgently create a professional commission for developing reliable and effective (acceptable for all counterparts) exit strategy on transferring the orchards to the ultimate owners/beneficiaries and conduct actual transfer. Providing the previous ineffective cooperation between the management of the FA and the IFAD team, the version of delegating this task to other implementers (i.e. replacement of at least one team) is recommended.
- The amount spent for the FA component implementation is quite big and the results achieved against those funds are far not sufficient. Implementation of objective assessment going deep into details is recommended for learning lessons and identifying the bottlenecks that conditioned the non-achievement of the FA component results. This is the best way of avoiding similar mistakes in future similar initiatives. It is strongly recommended that assessment should be conducted with a joint team of international and local experts without involvement of actual implementers to avoid any conflicts of interests.

5 RACP RESULTS: COMPONENT 2 (INFRASTRUCTURE REHABILITATION)

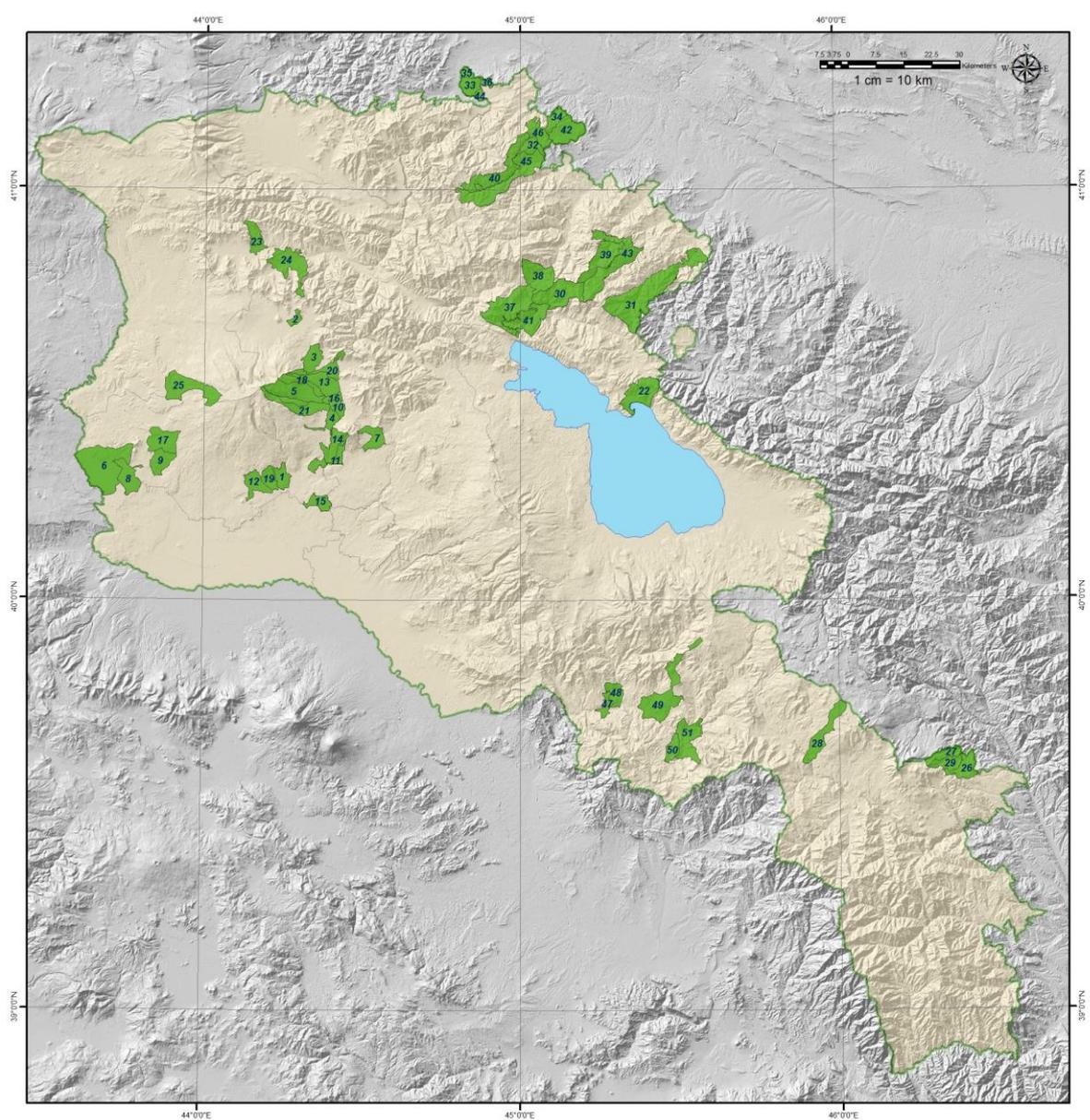
5.1 REHABILITATION OF PUBLIC UTILITIES: NATURAL GAS SUPPLY

The following chapters will address various aspects of the RACP Natural Gas Supply (NGS) sub-component implementation. Different issues in this regard have been suggested by the current assignment ToR, the IFAD's RIMS, and the IFAD's Supervision Mission Report in 2015. The mentioned issues have been introduced in the form of indicators that IA implementation team classified into the major groups respective to the pillars of Effectiveness, Impact, Sustainability, and General Issues.

5.1.1 Effectiveness

(ID14). Households receiving (infrastructure) project services (RIMS 1st level) (Number); (ID15). Communities receiving (infrastructure) project services (RIMS 1st level) (Number); (ID16). Communities benefitting from gas (RIMS 1st level) (Number); (ID17). Households benefitting from gas (RIMS 1st level) (Number). In total, 51 communities of 7 Marzes have been targeted for the implementation of the NGS sub-component.

Map 3 - NGS sub-component implementation area



Some of projects have been initiated earlier, completed and handed over to the respective organization (Gasprom Armenia CJSC) and local beneficiaries; others are still in the process of implementation. Achievement of the NGS sub-component implementation objectives as of the IA implementation moment is presented below.

Table 33 - Communities and households receiving (infrastructure) project services, NGS systems constructed/rehabilitated

Marzes	(ID15)	(ID14)	(ID16)	Handed over in	(ID17)	% of design	
	Communities receiving NGS services (number)	HHs receiving NGS services (number)	Communities benefitting from gas (number)		Households benefitting from gas (number)	Communities	HHs
Aragatsotn	1. Aghdzq	436		Not yet transferred	0	0%	0%
	2. Alagyaz	90	1. Alagyaz	2014* / 2016****	9	100%	10%
	3. Aparan city (Jalalyan, Poshter and Lusavorich blocks)	117		Not yet transferred	0	0%	0%
	4. Apnagyugh	120	2. Apnagyugh	2014* / 2016**	68	100%	57%
	5. Aragats	550	3. Aragats	2014* / 2016**	110	100%	20%
	6. Aragatsavan	1,369		Not yet transferred	0	0%	0%
	7. Arayi	107	4. Arayi	2014* / 2016**	34	100%	32%
	8. Arteni	991		Not yet transferred	0	0%	0%
	9. Dashtadem	105		Not yet transferred	52	0%	50%
	10. Hartavan	160	5. Hartavan	2014* / 2016**	71	100%	44%
	11. Karbi	60	6. Karbi	Not yet transferred	29	100%	48%
	12. Kosh	500	7. Kosh	2014* / 2016**	60	100%	12%
	13. Kuchak	112	8. Kuchak	2014* / 2016**	107	100%	96%
	14. Ohanavan	280	9. Ohanavan	2014* / 2016**	103	100%	37%
	15. Sasunik	860		Not yet transferred	0	0%	0%
	16. Shenavan	299	10. Shenavan	2014* / 2016**	176	100%	59%
	17. Talin	83		Not yet transferred	0	0%	0%
	18. Tsahgkashen	65	11. Tsahgkashen	2014* / 2016**	41	100%	63%
	19. Ujan	600	12. Ujan	2014* / 2016**	178	100%	30%
	20. Vardenis	134	13. Vardenis	2014* / 2016**	95	100%	71%
	21. Vardenut	210	14. Vardenut	2014* / 2016**	73	100%	35%
Gegharkunik	22. Artanish	250		2016***	6	0%	2%
Lori	23. Shirakamut	65	15. Shirakamut	2014*	17	100%	26%
	24. Spitak city (Grigor Lusavorich district)	50	16. Spitak city (Grigor Lusavorich district)	2014*	42	100%	84%
Shirak	25. Sarnaghbyur	300		Not yet transferred	0	0%	0%
Syunik	26. Khnatsakh	235		2016***	0	0%	0%
	27. Khoznavar	99		2016***	0	0%	0%
	28. Spandaryan	76	17. Spandaryan	2014* / 2016**	39	100%	51%
	29. Vaghatur	108		2016***	0	0%	0%
Tavush	30. Aghavnavank	155		Not yet transferred	0	0%	0%
	31. Aygedzor	110		Not yet transferred	0	0%	0%
	32. Baghanis	262	18. Baghanis	2014* / 2016**	0	100%	0%
	33. Bagratashen	980		Not yet transferred	0	0%	0%
	34. Barekamavan	275	19. Barekamavan	2014* / 2016**	0	100%	0%
	35. Debedavan	260		Not yet transferred	0	0%	0%
	36. Deghdzavan	81		Not yet transferred	0	0%	0%

Marzes	(ID15)	(ID14)	(ID16)	Handed over in	(ID17)	% of design	
	Communities receiving NGS services (number)	HHs receiving NGS services (number)	Communities benefitting from gas (number)		Households benefitting from gas (number)	Communities	HHs
	37. Gosh	399				Not yet transferred	0
38. Hovq	177		20. Hovq	2014* / 2016**	0	100%	0%
39. Itsaqar	105			Not yet transferred	0	0%	0%
40. Jujevan	140			Not yet transferred	0	0%	0%
41. Khachardzan	142			Not yet transferred	0	0%	0%
42. Koti	913		21. Koti	2014* / 2016**	0	100%	0%
43. Navur	294			Not yet transferred	0	0%	0%
44. Ptghavan	312			Not yet transferred	0	0%	0%
45. Voskepar	304		22. Voskepar	2014* / 2016**	0	100%	0%
46. Voskevan	426		23. Voskevan	2014* / 2016**	0	100%	0%
Vayots Dzor	47. Arpi	63		2016***	0	0%	0%
	48. Getap	210		2016***	0	0%	0%
	49. Malishka	730		Not yet transferred	0	0%	0%
	50. Por	22		2016***	0	0%	0%
	51. Zaritap	82		2016***	0	0%	0%
Total	51	14,873	23	-	1,310	45%	9%

* - Transferred on 27.11.2014. (GoA Decision N 1330-A)

** - Extension transferred on 28.04.2016. (GoA Decision N 425-A)

*** - Transferred on 28.04.2016. (GoA Decision N 425-A)

**** - Protection network, transferred on 28.04.2016. (GoA Decision N 425-A)

Once the infrastructure was handed over, local population started joining to the NGS systems. In the meantime, the number of beneficiaries of the NGS sub-component is not limited with only local population. Additional beneficiaries are **14 public entities¹¹ (municipalities, schools, culture houses, ambulatories, etc.)** and **6 businesses operating in the targeted communities.**

5.1.2 Impact

(ID1). Number of rural people living on < USD 4.30/day (Percent). It is important to specify that this indicator was calculated on the basis of living expenditures (only livelihood expenses, i.e. investment and business expenditures excluded) reported by beneficiaries. This also includes in-kind consumption of own agricultural produce, i.e. cash and non-cash income of HHs. The following table introduces absolute number of such people and their households, as well as their share in total number of surveyed respondents. Inclusion of the number of households is another recommendation of the IFAD RIMS.

Table 34 - Number of rural people living on less than \$4.30 per day

	Households	People
Total number of surveyed respondents	89	421
Number of people living for less than \$4.3 per day	46	236
Share of people living for less than \$4.3 per day in total	52%	56%

This indicator directly measures the poverty level in communities of the IA implementation. The share of people living on less than \$4.3 per day is quite high, i.e. the poverty level is significant. This level is notably higher than the average for the whole country, which is legitimate. The Project mainly targeted and has been implemented in remote, bordering, rural communities that are the least secured places in the country. Implementation of the RACP in general, and the NGS sub-component in particular aimed at improvement of livelihood conditions exactly for such poor people.

¹¹ In communities of Aragatsotn Marz (Apnagyugh, Aragats, Hartavan, Karbi, Kuchak, Ohanavan, Ujan, and Vardenis)

(ID2). Increase of household asset ownership in communities benefiting from RACP activities (Percent). 97% of beneficiaries of the RACP NGS sub-component registered increase of assets (in type, quantity, or value) in the period of 2010-2016. In order to conduct the measurement of change, the assets of beneficiaries may be conditionally divided into 2 groups: business (agricultural land, domestic animals, agricultural machinery, etc.) and household (house, passenger car, furniture, etc.) assets.

Table 35 - Increase of household asset ownership

Types of assets	Own the assets	Procured the assets in the recent 5 years	Procurement value, \$ ¹²	Average procurement value per 1HH, \$
	A	B (= % in A)	C	D
Land plot	100%	3%	3,953	1,318
Cattle, sheep and goats, pigs	67%	27%	9,520	595
Beehives	12%	55%	1,689	281
Cowshed	82%	5%	11,992	2,998
Agricultural machinery	27%	17%	14,929	3,732
Vehicle	19%	29%	10,866	2,173
Greenhouse	0%	-	-	-
House	100%	3%	114,537	38,179
Passenger car	69%	64%	239,452	6,140
Furniture	100%	34%	60,671	2,022
TV set	99%	49%	36,013	838
Washing machine	97%	56%	19,589	408
Refrigerator	97%	41%	26,982	771
Water heater	76%	94%	10,734	168
Heating system	25%	68%	22,920	1,528
Gas stove / oven	99%	34%	10,267	342
Total			594,114	6,675

97% of beneficiaries registered increase of household assets vs. 22% of HHs that registered increase in business assets. The most frequently procured household assets were washing machines, water heaters (and heating systems), refrigerators, gas stoves/ovens, and cars. In case of business assets, the most often met assets were various domestic animals. Interestingly, investments in business infrastructure became observable (such as investments in machinery, cowshed, etc.). **Average increase of the value of (all) assets per beneficiary in the period of 2010-2016 comprised \$6,675** (according to the respondents' estimation/valuation (based on actual procurement prices) of their assets).

From the viewpoint of the NGS sub-component implementation it is important to note that procurement of some HH items (boilers, water heaters, heating systems, stoves, ovens, etc.) is directly connected with the gasification of the communities. Finally, though beneficiaries did not mention about this investment, but all HHs that connected to the NGS infrastructure invested 100-150 thousand AMD as induced investments.

(ID38). Household Assets Ownership Index of targeted population (*Percentage (to be reported as share of targeted households with improvement in household asset ownership, disaggregated by male and female headed households)*). Some assumptions should be made on definition/identification of man or woman headed HH. In most of HHs decisions are being made mutually, by man and woman ruling the HH. In certain communities having substantial level of work migration of the male population the situation requires additional reservations - almost all decisions are being made by women, but with remote knowledge and confirmation of HH male members.

¹² Respondents mentioned prices in AMD. For converting into USD the IA implementation team applied the exchange rate of \$1=408.6 AMD, which was calculated to be the average value for the period of 2010-2016

Table 36 - Households with improvement in household asset ownership

	Household Assets Ownership Index		
	Total Assets	Business Assets	Household Assets
Share of HHs that registered any increase of assets in 2010-2016, of which:	96.6%	32.6%	96.6%
- <i>In male headed HHs</i>	96.2%	26.4%	96.2%
- <i>In female headed HHs</i>	97.2%	41.7%	97.2%

The only major finding related to the increase of assets is that in growth of business assets is more notable in female-headed HHs. This is rather strange, since usually men are more tend to and ready for capital investments than women. The situation can be explained by major extent of work migration of male population.

(ID3). Increase in income for target households participating in the Programme activities (Percent).

None of surveyed households had comprehensive information on the size of their income. The reasoning of such negative finding is the following:

- There is no practice/culture/habit of keeping records on income among surveyed households. That is why, the figures they tell are usually approximate and incomplete. People tend to forget Irregular (one time) and small income. Bigger than usual (also one-time/irregular) income they prefer not to mention, at all. In both cases the information they provide is being distorted.
- Information about agricultural income is also incomplete and approximated. Part of agricultural produce is being consumed within the households for subsistence purposes. Most of farmers does not equal/identify that consumption as income. Some produce is being sold, including the barter, which is not being evaluated in monetary means, either. Finally, a certain quantity of agricultural products is being processed for further sales or consumption; farmers tend to skip that volume, too.

On contrary, people used to be more cautious while talking about expenses, thus, the provided information is more accurate. In such cases, it is widely accepted to justify the value of income indirectly, via application of the amount of expenses. The basic (rough) assumption is that amount of income plus savings should at least total to the amount of expenses. This method was applied also for the justification of the information provided by respondents; the justified amount was included under the row of “*Other sources*”.

Table 37 - Size and structure of beneficiary households' income

	Income					
	After RACP (2016)		Before RACP (2010)		Change	
	USD	Share	USD	Share	USD	%
Total income of surveyed beneficiary households, including proceeds from:	1,034,781	100%	852,958	100%	181,823	21%
- Agriculture	305,056	29%	257,749	30%	47,307	18%
- Work remuneration	149,085	14%	122,442	14%	26,642	22%
- Self-employment	45,521	4%	51,395	6%	-5,874	-11%
- Rent of assets by others	245	0%	245	0%	0	0%
- Work migration of household member	51,028	5%	90,186	11%	-39,158	-43%
- Relatives and friends	3,855	0%	2,301	0%	1,554	68%
- Pensions and allowances	98,056	9%	54,622	6%	43,435	80%
- Other sources	381,936	37%	274,019	32%	107,917	39%

In the period of RACP implementation, overall income of **NGS sub-component beneficiaries' households grew for 21%**. Agriculture seems to be the major source of income, though the biggest change is observed in the share of pensions and proceeds received from friends and relatives. However, the change in income from different sources should not be attributed to the implementation of the NGS sub-component. The nature of intervention is different this time; it traces rather social objectives than economic targets.

Table 38 - Increase in income

	Income, USD			Increase in income
	After RACP (2016)	Before RACP (2010)	Change	
Total income of surveyed households	1,034,781	852,958	181,823	21%
Average income per household	11,627	9,584	2,043	

In the meantime, not all the surveyed households registered increase in income in the period of 2010-2016. Actual increase is registered only with 70% of surveyed households, while in case of remaining 30% there was a decrease of income. However, again, these changes are not anyhow related to the implementation of the Project and NGS sub-component.

Table 39 - Change in income

	Change in income			
	Increase	No change	Decrease	Total
Share of beneficiaries	70%	0%	30%	100%
Amount of change	279,629	0	-97,805	181,823
Change per household, \$	4,510	0	-3,622	2,043

Other benefits conditioned by the implementation of the NGS sub-component of the RACP.

Implementation of the NGS sub-component resulted in a number of different effects. The ToR of the current assignment addressed only part of it. However, the survey of the sub-component beneficiaries revealed other positive aspects and achievements beyond the indicators suggested. The most important aspects are presented below.

Table 40 - Other positive implications of the RACP implementation

Implications	Share of respondents
Local population solves hygienic issues much easier and more effectively	94%
All rooms are being heated equally	15%
Fire risks are resolved totally or brought to the minimum	61%
Gas heating is much safer for small children, they cannot damage themselves when touching devices	62%
Houses are not being smudged with smoke and ash	65%
The air is not being polluted with smoke as it happens in case of using wood and manure (cow dung)	75%

(ID8). A reduction of wood used for heating/cooking in villages where gasification introduced (Percent). RACP beneficiaries have been and are using different types of fuel for heating (electricity, natural gas, wood, coal, cow dung, etc.) both before and after the implementation of the NGS sub-component. This indicator directly targets the extent of using firewood. The fuel used by beneficiaries can be divided into 2 groups:

- Fuel that can be bought, only.** Examples are the electricity, natural gas, liquid gas, oil, diesel, etc.
- Fuel that (except of buying) can be collected or obtained free of charge.** Examples are the firewood, coal, cow dung, other means collected from the forest.

Only the population of communities adjacent to the forests has an access to firewood free of charge. These people are usually being able to log/cut/collect some quantity of wood from the forest and store for the winter. Providing the growing prices for the gas and expensiveness of connecting to the main pipeline, it becomes quite reasonable and legitimate that local population still continues using firewood.

The surveyed beneficiaries mainly use firewood for heating purposes. The main reason is the cost; using the firewood is cheaper than gas. In the meantime, this statement is true only in case of heating the house partially, not in all rooms. In case of targeting to achieve the same efficiency of equal heating of all rooms of the house, the costs of using firewood or gas will comprise approximately the same amount. However, due

to high poverty in target communities, 79% of beneficiaries prefers using gas for cooking purposes, but heat the part of their houses in the winter by firewood.

Table 41 - Extent of heating houses in the winter

	After RACP (2016)			Before RACP (2010)			Change
	Average living area of 1 HH	Heated area at 1 HH place		Average living area of 1 HH	Heated area at 1 HH place		
	m ²	m ²	%	m ²	m ²	%	
Extent of heating the house in the winter	160	89	55%	162	77	48%	17%

Due to abovementioned reasons the use of natural gas for heating purposes in surveyed communities is yet limited. As of the IA implementation moment, only 11% of beneficiaries connected to the NGS infrastructure use the gas for heating purposes. The situation is completely different in case of using natural gas for cooking and other purposes. All connected beneficiaries started using gas for cooking purposes. This, legitimately, decreases the quantity of wood used before for cooking significantly, or rather skips it. Thus, the conclusion is rather unambiguous: after the implementation of the NGS sub-component, the use of firewood decreased significantly.

Average saving of firewood in surveyed HHs comprised 4.5m³ per HH (see [Table 43](#)), annually. Providing the number of benefiting HHs is 1,310 in all communities, the total volume of saved wood comprises about 5,900 m³. This figure can be also translated in ha of saved forest by considering an average of 700 m³/ha (0.5m³ of firewood from a mid-sized tree and 14 trees on 100 m²). **Annual saving of the forest area comprises over 8 ha of forest annually. However, this figure will grow continuously and drastically along with the increase of the number of beneficiaries connecting to NGS infrastructure.**

Table 42 - Use of different fuel

For heating purposes

Fuel types	After RACP (2016)				Before RACP (2010)				Change		
	Number of using HHs	Of which, obtaining fuel for payment	Amount paid, AMD / annually	Cost per 1 HH, AMD / annually	Number of using HHs	Of which, obtaining fuel for payment	Amount paid, AMD / annually	Cost per 1 HH, AMD / annually	Number of using HHs	Of which, obtaining fuel for payment	Cost per 1 HH, AMD / annually
Electricity	16	16	869,000	54,313	18	18	3,342,000	185,667	-11%	-11%	-71%
Firewood	76	67	8,909,000	132,970	81	74	9,367,000	126,581	-6%	-9%	5%
Natural gas	10	10	2,153,000	215,300	0	0	0	0	-	-	-
Liquid gas	0	0	0	-	0	0	0	0	-	-	-
Oil, diesel	4	4	36,000	9,000	4	4	34,000	8,500	0%	0%	6%
Coal	1	1	180,000	180,000	2	2	220,000	110,000	-50%	-50%	64%
Cow dung	53	10	407,000	40,700	54	9	359,000	39,889	-2%	11%	2%
Other	3	2	90,000	45,000	2	1	70,000	70,000	50%	100%	-36%

For other HH purposes

Fuel types	After RACP (2016)				Before RACP (2010)				Change		
	Number of using HHs	Of which, obtaining fuel for payment	Amount paid, AMD / annually	Cost per 1 HH, AMD / annually	Number of using HHs	Of which, obtaining fuel for payment	Amount paid, AMD / annually	Cost per 1 HH, AMD / annually	Number of using HHs	Of which, obtaining fuel for payment	Cost per 1 HH, AMD / annually
Electricity	89	89	9,517,000	106,933	89	89	8,275,400	92,982	0%	0%	15%
Firewood	0	0	0	0	74	59	2,125,000	36,017	-100%	-100%	-100%
Natural gas	89	89	6,391,500	71,815	0	0	0	-	-	-	-
Liquid gas	0	0	0	0	86	86	7,668,400	89,726	-100%	-100%	-100%
Oil, diesel	0	0	0	0	0	0	0	-	-	-	-
Coal	0	0	0	0	2	2	50,000	25,000	-100%	-100%	-100%
Cow dung	0	0	0	0	44	7	168,000	24,000	-100%	-100%	-100%
Other	0	0	0	0	1	1	7,000	7,000	-100%	-100%	-100%

Table 43 - Reduction of firewood used for heating and cooking

	After RACP (2016)			Before RACP (2010)			Change
	Cost per 1 HH, AMD / annually	Average price of firewood, AMD / m ³	Volume used per 1 HH, m ³ / annually	Cost per 1 HH, AMD / annually	Average price of firewood, AMD / m ³	Volume used per 1 HH, m ³ / annually	
Total cost of firewood, of which:	165,300	21,111	6.3	162,598	15,000	10.8	42%
- Heating	132,970	21,111	6.3	126,581	15,000	8.4	25%
- Other	0	21,111	0.0	36,017	15,000	2.4	100%

(ID9). Reduction in work days lost (Percent). One of negative consequences of the absence of NGS is the necessity to collect wood in big volumes for regular (cooking) and intensive (heating) use. Collection of wood was among the major problems for the surveyed HH members. That is why, the registered positive changes are really appreciated by local inhabitants, even if they still using some quantity of firewood. Dynamics of involvement of HH members in wood collection/logging activities is presented below.

Table 44 - Time spent for wood collection

	After RACP (2016)	Before RACP (2010)	Change
Time spent by the HH members for collecting/logging, transportation, shelving, breaking wood (man/day per 1 HH, annually), of which:	11.4	12.11	6%
- Men	8.0	8.5	6%
- Women	2.5	2.6	4%
- Children	0.9	1.0	10%

Conditional coefficient of involvement of HHs and their members in firewood related issues improved though not significantly. In any case, that left its positive effect especially on men, who were mainly in charge for the wood collection.

(ID33). Household Incomes by gender (cash and non-cash). Including but not limited to income from agriculture, livestock, employment, etc. (USD/annual average). Traditional specificities of Armenian reality should be taken into account for the segregation of HH income by gender. Some part of HHs' income is being generated **by personal activities of HHs' certain members**. That type of income can be attributed to a certain person and segregated by gender. Examples of such income generation activities are remuneration for permanent or temporary employment, self-employment, pensions, etc.

The other part of the HHs' income is being generated via **collective activities of several or all members of HHs**. The best example is the agricultural activity. Income generated via agriculture is impossible to separate among and attribute to HH members; there is no sufficient basis and objective information for that. Thus, if the engagement of a certain member of the HH can be specified as personal activity, then the income generated by that person can be fully attributed to him/her, i.e. segregate the income by gender. If it is not possible, the income cannot be attributed. Possibility of income segregation by gender of HHs members is presented in [Table 16](#) (page 20). The survey of the NGS component beneficiaries revealed that 37% of respondents HHs members are engaged in one of income generation occupations. Male members of the surveyed HHs ensure 74% of total income generated; respectively the share of income generated by female members comprises 26%.

Table 45 - Household Incomes by gender

	Total number of HH members	Of which, having own (personal) income		Total amount of income, \$/annual*	Per capita income, \$/annual
		Person	%		
Male	219	96	44%	199,817	2,081
Female	202	59	29%	70,181	1,190
Total	421	155	37% (weighted average)	269,998	1,742 (weighted average)

* - Information was collected in AMD. Conversion was made at the average exchange rate for 2016 - \$1=480 AMD, since this is about current income

(ID34). Household expenditures by type (USD/annual average). Size and structure of the expenditures may provide a lot of information about the livelihood standards of surveyed HHs. The higher is their income level, the bigger and more sophisticated is the consumption size and structure. Normally, poorer HHs spend more (proportionally in total income) on everyday needs (food, clothing, utilities), while more secured HHs allocate more funds (again proportionally) for other purposes (entertainment, travel, investments in business, etc.).

Table 46 - Household expenditures by type

Expenditures	Expenditures, \$				Change	
	After RACP (2016)		Before RACP (2010)		\$	%
	Total	Per 1HH	Total	Per 1HH	Per 1HH	
Total	988,506	11,107	742,545	8,343	2,764	33%
▪ Livelihood expenses	846,119	9,507	612,204	6,879	2,628	38%
- Food	234,895	2,639	174,170	1,957	682	35%
- Clothing and shoe	55,556	624	45,460	511	113	22%
- Electricity	25,419	286	28,432	319	-34	-11%
- Gas	20,912	235	117	1	234	178 times
- Firewood	21,804	245	22,925	258	-13	-5%
- Other fuel	7,199	81	26,190	294	-213	-73%
- Drinking water	2,959	33	2,229	25	8	33%
- Phone and internet	26,824	301	14,556	164	138	84%
- Public transport	7,380	83	16,007	180	-97	-54%
- Fuel for own car	53,713	604	33,463	376	228	61%
- Education	20,142	226	25,431	286	-59	-21%
- Healthcare	74,249	834	45,799	515	320	62%
- Other household expenses	27,183	305	22,526	253	52	21%
- Leisure and entertainment	6,828	77	4,780	54	23	43%
- Travel	8,370	94	9,153	103	-9	-9%
- House maintenance and repair	69,316	779	25,246	284	495	175%
- Car maintenance and repair	26,290	295	13,341	150	145	97%
- Asset tax, insurance, fees	13,164	148	3,759	42	106	250%
- Loan principal and interest	96,194	1,081	56,818	638	442	69%
- Events	47,724	536	41,801	470	67	14%
▪ Business costs for self-employment	6,412	72	11,698	131	-59	-45%
▪ Agricultural activities' costs	135,975	1,528	118,643	1,333	195	15%
- Land cultivation costs	87,705	985	79,199	890	96	11%
- Animal husbandry costs	48,270	542	39,443	443	99	22%

Increase in the amount of almost all expenditures is obvious - 33%. The major reason for this is the inflation - prices of all products and services should have increased and did. This especially relates to price of food and other products of the first importance. Average annual inflation rate in Armenia in the recent period of 5 years varied around 5-7% despite several cases of unexpected and critical jumps (as it happened in December 2014). The following reasons are, however, the changes in surveyed HHs income and livelihood. The biggest changes (aside from those for food) in the structure of expenditures were conditioned with the following:

1. **Houses and cars maintenance and repair.** These costs are conditioned with old age and obsolete conditions of transportation means and houses in remote rural communities. The older are assets, the bigger are costs for their repair.
2. **Loan repayments.** The number of rural HHs lending money from financial institutions grew significantly in the recent years. Moreover, farmers started attracting loans from several institutions, use sophisticated financial products, capitalizing interests, etc. It is very hard to provide unambiguous estimates to this phenomenon, but in its majority it can be assessed as positive. Farmers normally attract loans only in case if they believe in possibility and ability of repaying.
3. **Healthcare.** These expenditures grew substantially mainly due to aging of local population.
4. **Gas** became one of the biggest rows of HH expenditures. Continuous increase of gas prices makes this cost substantial in the HHs budget. Before the project HHs were almost not using gas, but now it became an important aspect of their livelihood.
5. **Asset taxes, insurance, and fees. Phone and internet.** Newly appeared expenditures have already been addressed. Several years ago, a new regulation was adopted making the insurance of transportation means mandatory.

(ID53). Production processing by type (Volume and value). Normally, the bigger is the volume of commercial processing, the higher is the value added, which influences the farmers' income increase. However, before passing to the analysis of the volumes of different products' processing, some reservations should be made:

1. Processed agricultural products are not homogenous and comparisons between different products may not be relevant. In other words, comparing volumes of wheat flour (processed wheat) and wine (processed grape) is good for nothing. This means, there is no reason and meaning in identification of privileged processed products.
2. Some processing is being made still for HHs' own subsistence consumption and does not yet mean a process of additional value generation.

Table 47 - Production processing by type

	After RACP (2016)				Before RACP (2010)				Change	
	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Value per HH, \$/HH
Total	82	-	31,595	385	79	-	26,484	335	4%	15%
▪ Land cultivation products	76	11,373	6,997	92	70	11,913	6,589	94	9%	-2%
- Wheat	1	800	392	392	1	900	441	441	0%	-11%
- Other cereals	0	0	0	-	0	0	0	-	-	-
- Legumes	15	414	389	26	14	390	366	26	7%	-1%
- Technical crops	0	0	0	-	0	0	0	-	-	-
- Potato	0	0	0	-	0	0	0	-	-	-
- Cabbage	11	500	83	8	11	620	100	9	0%	-18%
- Cucumber	7	160	39	6	4	110	18	5	75%	22%
- Tomato	9	575	129	14	9	700	161	18	0%	-20%
- Eggplant	3	110	22	7	3	105	21	7	0%	6%
- Pepper	2	15	7	4	2	24	12	6	0%	-39%
- Carrot	2	35	13	7	2	35	13	7	0%	0%
- Onion	0	0	0	-	0	0	0	-	-	-
- Garlic	1	50	122	122	1	70	171	171	0%	-29%
- Watermelon	0	0	0	-	0	0	0	-	-	-
- Melon	0	0	0	-	0	0	0	-	-	-
- Apple	21	820	363	17	18	710	320	18	17%	-3%
- Pear	11	298	185	17	9	198	138	15	22%	9%
- Apricot	24	1,567	755	31	21	1,432	516	25	14%	28%
- Peach	20	1,295	835	42	19	1,305	830	44	5%	-4%
- Sweet cherry	23	402	352	15	15	489	374	25	53%	-39%
- Cherry	29	714	456	16	25	530	382	15	16%	3%
- Plum/prunes	19	934	754	40	11	247	115	10	73%	278%
- Nuts	7	159	396	57	6	208	534	89	17%	-36%
- Persimmon	0	0	0	-	0	0	0	-	-	-
- Fig	0	0	0	-	0	0	0	-	-	-
- Berries	23	625	964	42	18	490	805	45	28%	-6%
- Grapes	5	1,900	740	148	4	3,350	1,273	318	25%	-53%
▪ Animal husbandry products	54	-	24,598	456	56	-	19,894	355	-4%	28%
- Milk (liter)	52	67,810	21,157	407	55	60,590	17,060	310	-5%	31%
- Meat (kg)	11	725	3,441	313	9	645	2,834	315	22%	-1%

As it can be seen in the table above, notable positive change (of about 15%) in processing value is registered, but that growth is attributable only to a limited number of processed products. Processing volumes for many

products decreased. Reasons for such decrease are different, but we shall not address them in the context of assessing the NGS sub-component implementation, the attribution capacity is very low.

(ID71). Number of jobs generated by small and medium enterprises in project targeted areas (Number of new employees, disaggregated by gender). (ID92). Rural Enterprise Development and employment Effectiveness: creation of employment opportunities (Number of new jobs created). Implementation of the NGS sub-component resulted in establishment of new businesses and generation of jobs at SMEs in targeted communities. In the meantime, this is not the end and formation of new businesses will definitely continue in the near future. Statistics of the establishment of new businesses and opening of new jobs (directly attributable to the RACP) is presented below.

Table 48 - Number of businesses established and employment generated due to implementation of NGS sub-component and

Marzes	Communities of completed projects	Small and medium enterprises in project targeted areas		
		Number	Description	Jobs created
Aragatsotn	1. Kosh	2	2 gas stations	30 employees
	2. Ohanavan	1	Bakery	5 employees
	3. Ujan	1	Gas station	10 employees
Tavush	4. Hovq	1	Gas station	8 employees
Vayots Dzor	5. Arpi	1	Gas station	15 employees
Total	5	6		68 employees

Implementation of the NGS sub-component created also positive expectations both in communities where the projects were completed, and where they are in process of implementation. Stakeholders from those communities also reported about establishment of businesses, but since they could not be directly attributed to the NGS system reconstruction, we skipped presenting them. Similarly, plans for establishment of new businesses were not included into the table, neither. Stakeholders reported about their plans to establish at least 14 more businesses ensuring about 275 new jobs, but these findings are suggested as additional evidence for positive attitude rather than facts.

5.1.3 Sustainability

(ID64). Likelihood of sustainability of social infrastructure. (ID86). Likelihood of sustainability of groups managing social infrastructure strengthened. Once the NGS infrastructure is constructed/rehabilitated it is being handed over to the respective organization for further exploitation, operation, and management. There is only one organization in Armenia servicing this sphere - Gasprom Armenia CJSC. This organization is among the biggest, strongest, and most capacitated firms in Armenia. It has its tens of branches in all regions, sub-regions, and towns of the country. All branches are very well equipped and the best technical professional is attracted. They (via contracted organizations) conduct regular preventive diagnosis of exploited infrastructure and connections. The rate of accidents is very low. **Based on the presented information it can be concluded that sustainability of the infrastructure and managing organization as Very Strong.**

(ID69). Operation and Maintenance (O&M) organizations/groups. Problems with O&M (Type/Number). Any infrastructure requires O&M measures and expenses over the period of exploitation. Properly organized O&M guarantees the sustainability of the infrastructure work and long lasting exploitation. O&M issues may conditionally be divided into the following two major aspects: a) availability of O&M service providers and b) affordability of O&M costs. These O&M issues were addressed in surveyed communities with completed NGS projects, and the situation is the following.

Table 49 - Beneficiaries' awareness on irrigation system O&M

Questions	Beneficiaries' responses			
	Yes	No	Do not know	Total
Do you have an Operation and Maintenance (O&M) organization servicing your irrigation system?	93%	7%	0%	100%
↓				
Do you know the name of the O&M organization?	57%	43%	-	100%
↓				
Please provide the name of the O&M organization:				
- Gazprom-Armenia	34%			
- AG, GLV	6%			
- Know only the name of the O&M organization representative	60%			

Overwhelming majority of surveyed beneficiaries is aware of the availability of the provision of O&M services, i.e. they know that there is such organization that provides O&M services. Interestingly, for the majority of beneficiaries the O&M service providers are identified with specific persons, not an organization. However, it is understandable that in small rural communities' consumers do not name the organization, but a person delivering services on behalf of that organization.

Availability of safety device. All the surveyed beneficiaries stated that organization that is in charge for servicing the system (Gasprom Armenia or AEG) provided them with the safety device and installed those devices in houses of beneficiaries. This is very important preventive measure against the poisonings and fire accidents.

5.1.4 Other Issues

(ID26). People/HHs in target area (Number).

Table 50 - People/HHs in target area

	HH	Population
Total	14,873	70,349

(ID27). Average HH size (Number). Size of HHs in the target area is a very important indicator that not only describes the social status and composition of beneficiaries' families, but is also being used in calculation of many other important indicators, such as per capita income and expenditures. Good ground for comparisons may serve the average figures for HH members in Armenia that varies around 4 persons per HH.

Number of HH members	HHs		Total number of HH members, persons	Average number of HH members, person/HH
	Number	Share		
1 person	3	3%	3	↓
2 persons	11	12%	22	
3 persons	13	15%	39	
4 persons	16	18%	64	↓
5 persons	12	13%	60	
6 persons	19	21%	114	
7 persons	8	9%	56	↓
8 persons	3	3%	24	
9 persons	1	1%	9	
10 persons	3	3%	30	
Total	89	100%	421	4.73

The average number of HH members in surveyed communities exceeds the average figure for Armenia. This phenomenon has the following explanations:

- Traditionally, the HHs in rural areas of Armenia are bigger than in urban places. People used to have more children in villages than in cities.
- Traditionally, several families in rural communities used to live within the same HH (i.e. under the same roof, sharing food and budget). Those families usually are the aged parents, 1 or 2 sons with their wives and children. Thus, HHs with reported figure of more than 6-7 persons does consist of such several generation families.

(ID28). Age (Classification into categories); (ID29). Gender (Male/female). Information on age distribution of surveyed HHs members is largely self-explanatory. Just one important conclusion can be derived: more than half of the surveyed HHs members are in the workable age of 20-60 years old. This means that there is no (and is not expected) lack of productive workforce to exploit the constructed/rehabilitated infrastructure.

Table 51 - Age

HH members age groups	Total number of HH members	
	Person	Share
0-4	22	5.2%
5-9	23	5.5%
10-14	22	5.2%
15-19	28	6.7%
20-24	48	11.4%
25-29	38	9.0%
30-34	35	8.3%
35-39	15	3.6%
40-44	22	5.2%

HH members age groups	Total number of HH members	
	Person	Share
45-49	33	7.8%
50-54	31	7.4%
55-59	38	9.0%
60-64	21	5.0%
65-69	10	2.4%
70-74	3	0.7%
75-79	16	3.8%
80+	16	3.8%
Total	421	100.0%

(ID29). Gender (Male/female). The survey of beneficiaries HHs revealed that share of male population slightly prevails. From the viewpoint of income generation this does not mean anything; currently most of women are equally engaged in economic activities as men. Moreover, usually they take also housekeeping responsibilities over the income generation activities.

Figure 5 - Gender

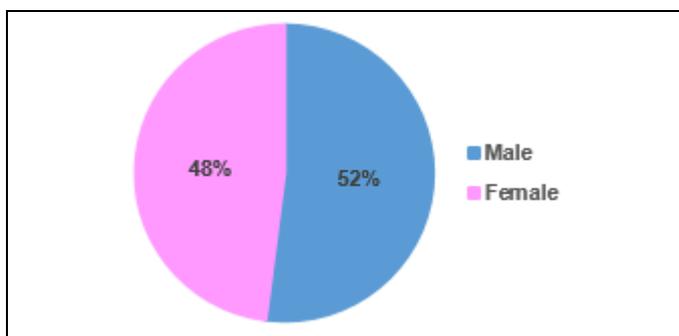
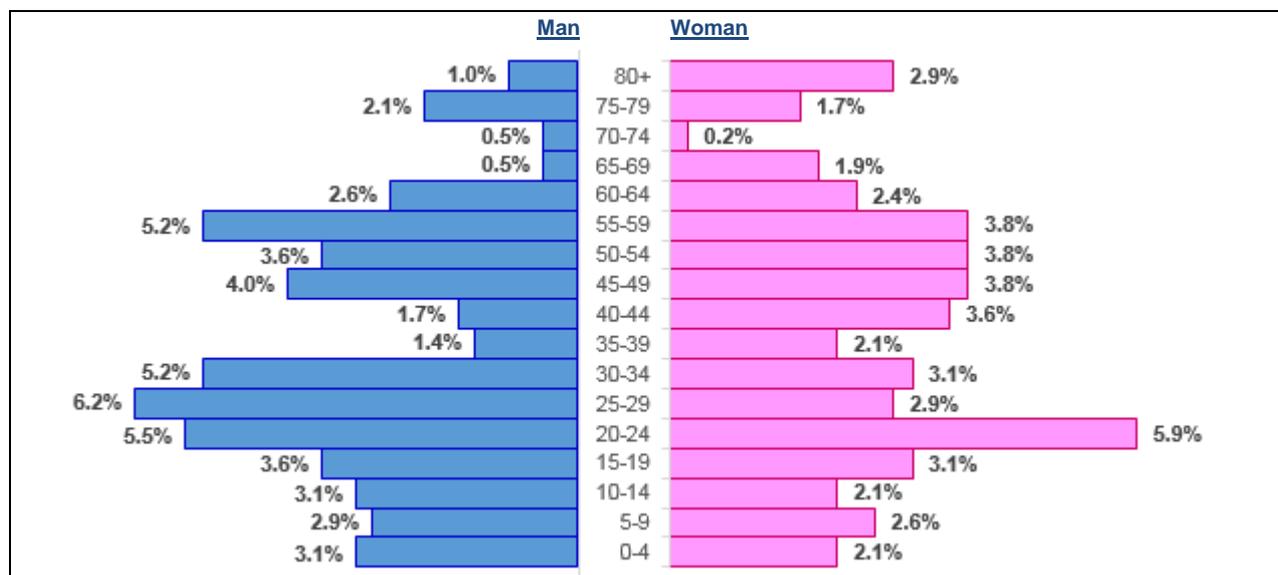


Figure 6 - The age pyramid of population (HH members)



Correlation and combination of age and gender information of the surveyed HHs members results in quite interesting findings. For some age groups there is a slight prevalence of male population upon the female population. This phenomenon is especially notable for the lower age groups. For the elder age groups (e.g. above 75) the situation is vice versa. The situation may be partially explained by negative developments of gender control measures applied widely in Armenia in the recent period.

(ID30). Education level (Classification into categories). As it was already mentioned the total number of surveyed HHs members comprised 421 persons, including 336 adults (80%). Distribution of adult population by educational levels is the following (see [Table 52](#)).

Table 52 - Education level

Education level	Share in the number of HHs' adults
Elementary or no education (0-3 classes)	2%
Main (4-8 classes)	6%
Secondary (9-10 classes)	54%
Vocational	17%
University	21%
Total	100%

(ID31). Marital status (Classification into categories). As it was already mentioned the total number of surveyed HHs members comprised 421 persons, including 336 adults (80%). Distribution of adult population by marital status is the following (see [Table 53](#)).

Table 53 - Marital status

Marital status	Share in the number of HHs' adults
Married	68%
Single	22%
Divorced	1%
Widow(er)	9%
Total	100%

(ID32). Occupation (Classification into categories). As it was already mentioned the total number of surveyed HHs members comprised 421 persons, including 336 adults (80%). Distribution of adult population by occupation is the following (see [Table 54](#)).

Table 54 - Occupation

Occupation	Share in the number of HHs' adults
Agriculture	18%
Permanent employment	13%
Temporary (seasonal) employment	7%
Permanent self-employment	2%
Temporary (seasonal) self-employment	4%
Unemployed, looking for job	7%
Student	4%
Pensioner	18%
Disabled	1%
Housekeeper	24%
Other	1%
Total	100%

(ID73). Women groups in target area (Number). (ID74). Youth groups in target area (Number). (ID75). Indigenous people inhabiting in target area (Number). The following table presented the availability of special groups of people in the targeted communities of the NGS sub-component implementation.

Table 55 - Women and youth groups and indigenous people in target area, 2016

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
Aragatsotn						
1. Aghdzq	0	0	0	0	20	0
2. Alagyaz	0	0	0	0	590	0
3. Aparan	0	0	1	11	8	0
4. Apnagyugh	1	12	0	0	20	15
5. Aragats	1	4	0	0	0	30
6. Aragatsavan	0	0	1	30	100	400
7. Arayi	1	15	1	22	0	0
8. Arteni	0	0	1	35	300	100
9. Dashtadem	0	0	0	0	10	0
10. Hartavan	1	4	0	0	1	10
11. Karbi	0	0	1	15	0	20
12. Kosh	0	0	0	0	16	260
13. Kuchak	0	0	0	0	1	0
14. Ohanavan	0	0	0	0	0	0
15. Sasunik	0	0	1	70	5	0
16. Shenavan	0	0	0	0	0	6
17. Talin	1	3	1	N/A	17	20
18. Tsahgkashen	1	15	1	15	0	15
19. Ujan	1	2	1	5	0	40
20. Vardenis	0	0	0	0	0	0
21. Vardenut	0	0	0	0	0	40
Gegharkunik						
22. Artanish	0	0	0	0	0	30
Lori						
23. Shirakamut	0	0	0	0	0	15
24. Spitak	0	0	0	0	0	0
Shirak						
25. Sarnaghbyur	0	0	1	20	0	40
Syunik						
26. Khnatsakh	0	0	0	0	0	0
27. Khoznavar	0	0	0	0	0	0
28. Spandaryan	0	0	0	0	0	0
29. Vaghatur	0	0	0	0	0	0
Tavush						
30. Aghavnavank	0	0	0	0	0	0
31. Aygedzor	0	0	0	0	0	20
32. Baghanis	0	0	1	15	2	0
33. Bagratashen	0	0	0	0	25	120
34. Barekamavan	0	0	0	0	0	0
35. Debedavan	0	0	0	0	2	10
36. Deghdzavan	0	0	0	0	0	0
37. Gosh	0	0	0	0	0	40
38. Hovq	0	0	0	0	1	0
39. Itsaqar	0	0	0	0	0	0
40. Jujevan	0	0	0	0	2	0
41. Khachardzan	0	0	0	0	0	0

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
42. Koti	0	0	0	0	0	15
43. Navur	1	6	0	0	0	10
44. Ptghavan	0	0	0	0	18	0
45. Voskepar	0	0	0	0	0	10
46. Voskevan	1	15	0	0	0	10
Vayots Dzor						
47. Arpi	1	12	0	0	0	0
48. Getap	0	0	1	11	1	0
49. Malishka	0	0	1	8	0	20
50. Por	0	0	0	0	0	0
51. Zaritap	0	0	0	0	0	20
Total	10	88	13	~257	1,139	1,316

The following clarifications should be provided to the information presented above:

1. Women Groups of Apnagyugh, Aragats, Arayi, and Hartavan were established by the Green Lane NGO with the purpose of raspberry production; Talin Women Council NGO is mainly engaged in organization of summer camping for children; Tsaghkashen Youth Club is engaged in preparation of development projects for the community; Ujan Agricultural NGO and Navur Civic Group are engaged in public works for their communities, and discussions of primary development prospective; Voskevan and Arpi Groups of Women are engaged in organization of events, in particular for (young) women;
2. Aparan Students Council, Voluntary Youth Union of Aragatsavan, Arayi Group of Young People, Youth Initiatives Group of Arteni, and many others (in the majority of targeted communities) are engaged in multiple aspects of their communities: preparation of development initiatives, organization of events, community cleaning events, cultural festivals, seminars and conferences, etc.

(ID78). Active service providers/donor organizations/ engaged in the communities (Number/scope of works). International and local development organizations are quite active in Armenia. Development initiatives largely target remote, bordering, and poor communities of Armenian regions, including many communities targeted by the RACP, too. Development initiatives are being funded and implemented by not only institutional specialized entities, but also various individuals and businesses. Availability of such initiatives in targeted communities and type of their intervention is presented below.

Table 56 - Development organizations and their programs in targeted communities

Community	Donor organization (Program)	Donor organization (Program)
Aragatsothn		
1. Aghdzq		
2. Alagyaz	ASIF Reconstruction of school	Latter Day Saint Construction of drinking water pipeline
3. Aparan	Green Lane NGO Provision of raspberry plants, training	
4. Apnagyugh		
5. Aragats	World Vision Armenia Support to kindergarten	Green Lane NGO Provision of raspberry plants, training
6. Aragatsavan	ENPARD Establishment of dried food producers, provision of equipment	CARD Establishment of Veterinary and Insemination Center
7. Arayi	APIU/CARMAC Establishment of Pasture Users Association	GIZ/IEC Project Afforestation Latter Day Saint Construction of Deep Wells

Community	Donor organization (Program)	Donor organization (Program)
8. Arteni	USAID Replacement of drinking water pipeline, installation of water meters	
9. Dashtadem		
10. Hartavan	USAID/ Clean Energy and Water Repair of pump station and network, installation of water meters, construction of pond, etc.	Orange Fund/ Shen Reconstruction of kindergarten, irrigation pipeline, school sports hall, provision of medical equipment. World Vision Armenia Reconstruction of Culture House
11. Karbi		
12. Kosh	ADB Reconstruction of drinking water supply network	
13. Kuchak	APIU/CARMAC Establishment of Pasture Users Association	GIZ/IEC Project Afforestation
14. Ohanavan	ASIF Reconstruction of kindergarten	
15. Sasunik	All Armenia Fund Reconstruction of kindergarten	ADB Reconstruction of drinking water supply network
16. Shenavan		
17. Talin	ASIF Reconstruction of kindergarten	Canadian individual Reconstruction of music school
18. Tsahgkashen	World Vision Armenia Reconstruction of irrigation network and kindergarten	Latter Day Saint Reconstruction of irrigation network, construction of pond
19. Ujan	ASIF Reconstruction of kindergarten	German Embassy Reconstruction of kindergarten Latter Day Saint Reconstruction of drinking water supply network
20. Vardenis	Latter Day Saint Reconstruction of drinking water supply network	Local businessman Street illumination
21. Vardenut	Latter Day Saint Construction of Deep Wells	
Gegharkunik		
22. Artanish		
Lori		
23. Shirakamut		
24. Spitak	UNDP Replacement of street lights with saving options	WB/UHP/R2E2 Fund Reconstruction of roofs of 27 multi-flat buildings, replacement of municipality and kindergarten heating equipment, etc.
Shirak		
25. Sarnaghbyur	UNICEF Kindergarten heating	
Syunik		
26. Khnatsakh		
27. Khoznavar	Strategic Program Provision of computers, establishment of cheese production, cold storage	
28. Spandaryan	WB/CARMAC Pasture watering project	
29. Vaghatur		
Tavush		
30. Aghavnavank		
31. Aygedzor	ASF Reconstruction of kindergarten, gasification of 1 st living block	
32. Baghanis	USA Paros Foundation Reconstruction of Ambulatory	All Armenia Fund Expansion of irrigation network UNDP

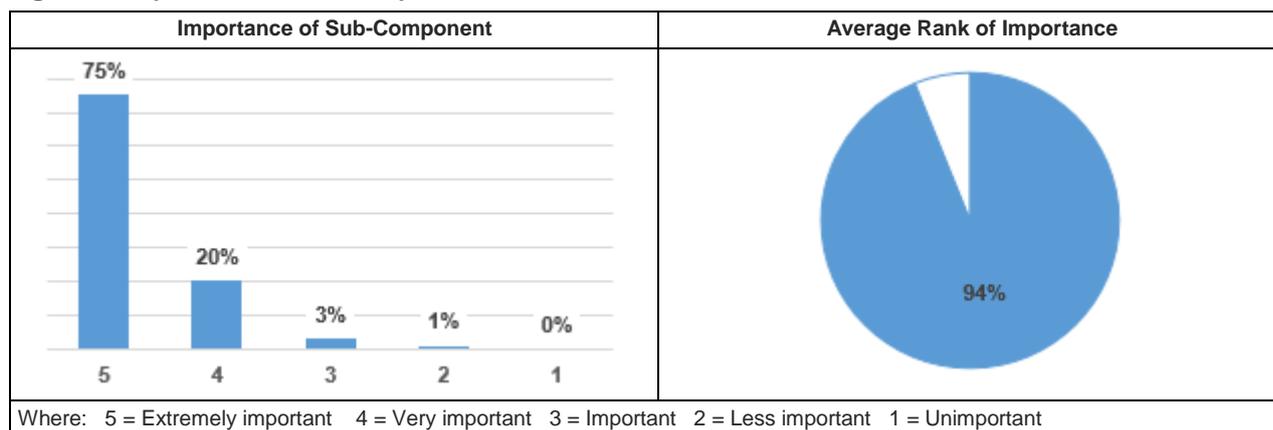
Community	Donor organization (Program)	Donor organization (Program)
		Establishment of 7 ha short nut orchard
33. Bagratashen		
34. Barekamavan	Red Cross Personal agricultural support, reconstruction of water pond	
35. Debedavan		
36. Deghdzavan		
37. Gosh		
38. Hovq	Red Cross Reconstruction of drinking water network	
39. Itsaqar	Austrian organization Establishment of milk procurement center	APIU/CARMAC Establishment of Pasture Users Association
40. Jujevan	EU Grant Project Reconstruction of drinking water network, provision of water meters, solid waste removal project	
41. Khachardzan	All Armenia Fund Construction of sports school, reconstruction of school	
42. Koti		
43. Navur		
44. Ptghavan	Government of France Reconstruction of kindergarten	
45. Voskepar	All Armenia Fund Construction of drinking water network	Red Cross Reconstruction of drinking water network, Deep Wells, construction of shelter
46. Voskevan		
Vayots Dzor		
47. Arpi	RDE/USA Establishment of cold storage	
48. Getap		
49. Malishka	ASIF Reconstruction of kindergarten	
50. Por		
51. Zaritap	ASIF Reconstruction of kindergarten	GIZ Construction of Municipality building

The table above bases on information collected immediately from the municipalities and Governorates of respective regions, but does not cover all issues related to development initiatives. Some important notes include:

- Many development organizations implement their activities (also for specific communities) from Yerevan or capitals of regions.
- Many projects have been completed and representatives of communities simply did not mention them. For example, UNDP implemented quite a long-lasting and wide development program in Tavush, but none of respondents mentioned it.
- Local beneficiaries and stakeholders tend to forget about development initiatives of “soft” nature, such as trainings and other capacity building. But many organizations provide exactly such support.

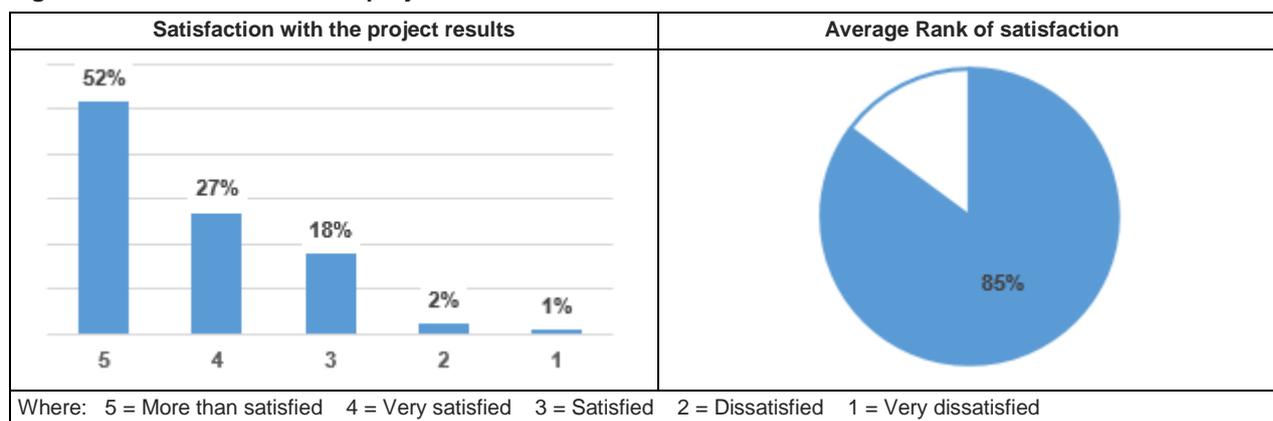
Importance of the NGS sub-component. Importance of the NGS sub-component was not included in the list of indicators initially provided in the ToR of the current IA. However, it was added during the discussions in the preparatory stage. Overwhelming majority of respondents ranked the inclusion of the NGS sub-component in the list of RACP activities as extremely important and important.

Figure 7 - Importance of Sub-Component



Satisfaction with the NGS sub-component implementation results. Assessment of the beneficiaries' overall impression and satisfaction with the results of the development interventions is always a challenging task. The biggest problem is in different interpretation of the attitude and practical impossibility of objective benchmarking. In such situations, the evaluators are left with the only option of relying on subjective feelings and attitude of respondents.

Figure 8 - Satisfaction with the project results



In case of the NGS sub-component implementation the conclusion is rather obvious: the extent of satisfaction among beneficiaries is very high. **The great majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.** The IA team did not address the reasons of being dissatisfied since the number of such beneficiaries is really few. Finally, the IA team addressed the extent of improvement of the beneficiaries' livelihood as a result of the NGS sub-component implementation. The statistics is the following.

Positive attitude of surveyed HHs is obvious. In the meantime, availability of 20% beneficiaries that cannot see any major improvement is also legitimate. This is being easily justified by the expensiveness of gas, which is, however, fully out of the RACPs' control.

Table 57 - HHs' perception on their livelihood improvement due to the project

Household perception	Share of HHs
Extremely improved	21%
Improved	58%
Not really improved	67%
Not improved at all	14%
Total	100%

5.1.5 Wrap-Up Conclusion

The following conclusions can be made from the analyses presented above:

1. The number of beneficiaries of the NGS sub-component is not limited with only local population. Additional beneficiaries are 14 public entities¹³ (municipalities, schools, culture houses, ambulatories, etc.) and 6 businesses operating in the targeted communities.
2. 97% of beneficiaries of the RACP NGS sub-component registered increase of assets but only part of that increase can be attributed to the RACP implementation, since major results did not happen, yet. However, procurement of some HH items (boilers, water heaters, heating systems, stoves, ovens, etc.) is directly connected with the gasification of the communities. Almost 90% of beneficiaries procured such assets directly related to the implementation of the NGS sub-component. The range of such investments comprised \$168-\$1,528 on average. Finally, all HHs that connected to the NGS infrastructure invested 100-150 thousand AMD as onetime payment for getting connected to the (re)constructed NGD infrastructure.
3. Income of the surveyed beneficiaries grew for 21%, but only part of that increase can be attributed to the sub-component implementation, since major results did not happen, yet.
4. Average saving of firewood in surveyed HHs comprised 4.5m³ per HH, annually. Providing the number of benefiting HHs is 1,310 in all communities, the total volume of saved wood comprises about 5,900 m³. This figure can be also translated in ha of saved forest by considering an average of 700 m³/ha (0.5m³ of firewood from a mid-sized tree and 14 trees on 100 m²). Annual saving of the forest area comprises over 8 ha of forest annually. However, this figure will grow continuously and drastically along with the increase of the number of beneficiaries connecting to NGS infrastructure.
5. Involvement of HHs and their members in firewood related issues improved though not significantly. In any case, that left its positive effect especially on men, who were mainly in charge for the wood collection and cutting.
6. Implementation of the NGS sub-component resulted in establishment of 6 businesses with 68 employees. In addition, it created also positive expectations both in communities where the projects were completed, and where they are in process of implementation. Stakeholders from those communities also reported about establishment of businesses.
7. Once the NGS infrastructure is constructed/rehabilitated it is being handed over to the respective organization for further exploitation, operation, and management. There is only one organization in Armenia servicing this sphere - Gazprom Armenia CJSC. This organization is among the biggest, strongest, and most capacitated firms in Armenia. It has its tens of branches in all regions, sub-regions, and towns of the country. Likelihood of sustainability of the infrastructure and managing organization -is Very Strong.
8. The extent of satisfaction among beneficiaries is very high. The great majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.

The following major reservation should be made in the context of the NGS sub-component IA implementation: Implementation of the IA was possible only in a part of communities where the rehabilitation of the NGS infrastructure was completed and handed-over for further exploitation. In the recent period, prices for gas steadily grew, which made overwhelming majority of consumers to limit their consumption for saving some costs. That is why, the gas is being used mainly for cooking. Regretfully, the population in rural areas continues using firewood and other fuel for heating purposes.

5.2 REHABILITATION OF PUBLIC UTILITIES: DRINKING WATER SUPPLY

The following chapters will address various aspects of the RACP Drinking Water Supply (DWS) sub-component implementation. Different issues in this regard have been suggested by the current assignment ToR, the IFAD's RIMS, and the IFAD's Supervision Mission Report in 2015. The mentioned issues have been introduced in the form of indicators that IA implementation team classified into the major groups respective to the pillars of Effectiveness, Impact, Sustainability, and General Issues.

Before passing to actual analysis of findings of the IA, an important statement should be made. The survey of the DWS sub-component beneficiaries has been conducted in 2 communities of Tavush Marz, where the

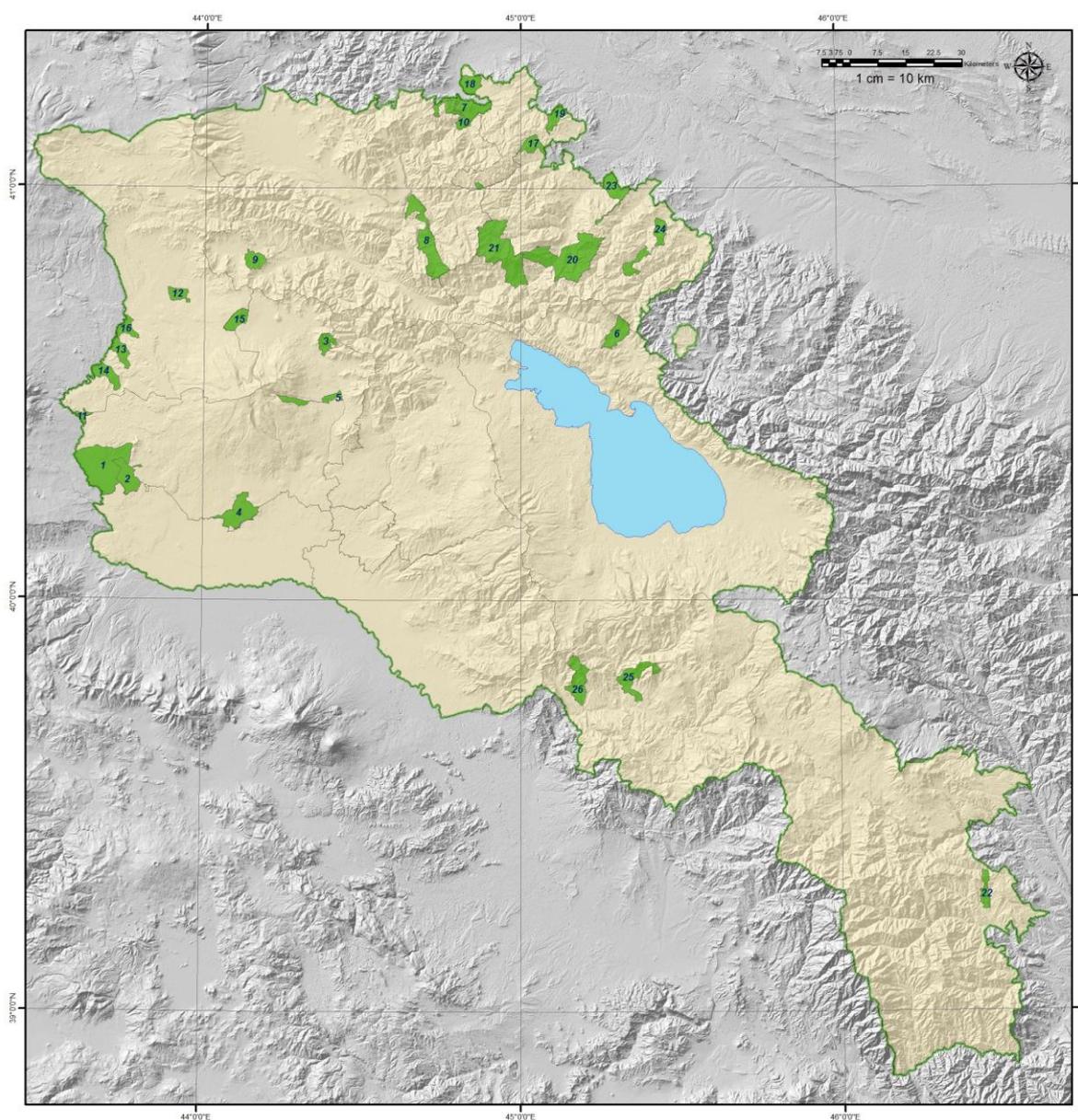
¹³ In communities of Aragatsotn Marz (Apnagyugh, Aragats, Hartavan, Karbi, Kuchak, Ohanavan, Ujan, and Vardenis)

rehabilitation of DWS infrastructure was completed and handed over in late 2014. Given the nature of using the drinking water (i.e. it is being consumed and results appear at HHs immediately) it can be assumed that direct outcomes of the sub-component are already observable. Changes conditioned by introduction of improved DWS have already happened and may be measured. In the meantime, one major reservation should be made. Improvement of DWS does not influence all aspects of livelihood of the surveyed HHs.

5.2.1 Effectiveness

(ID14). Households receiving (infrastructure) project services (RIMS 1st level); (ID15). Communities receiving (infrastructure) project services (RIMS 1st level); (ID18). Drinking Water Systems constructed/rehabilitated (RIMS 1st level); (ID19). HH benefiting from Drinking Water Systems constructed/rehabilitated (RIMS 1st level). DWS sub-component is being conducted in 26 communities, in total. However, only in 2 of them (Vazashen and Haghartsin villages of Tavush Marz) the projects of DWS systems have been completed and handed over, so far.

Map 4 - DWS sub-component implementation area



Local population benefits from the completion of those projects since the end of 2014.

Table 58 - Communities and households receiving (infrastructure) project services, DWS systems constructed/rehabilitated

	(ID15)	(ID14)	(ID19)	(ID18)
Marzes	Communities receiving DWS services (number)	HHs receiving DWS services (number)	HH benefiting from DWS systems constructed / rehabilitated (number)	DWS systems constructed / rehabilitated (% of design)
Aragatsotn	1. Aragatsavan	1,975	0	0%
	2. Arteni	760	0	0%
	3. Lusagyugh	270	0	0%
	4. Nor Yedesia	353	0	0%
	5. Shenavan	425	0	0%
Gegharkunik	6. Ttujur	293	0	0%
Lori	7. Chochkan	490	0	0%
	8. Dsegh	860	0	0%
	9. Katnajur	528	0	0%
	10. Mets Ayrum	297	0	0%
Shirak	11. Anipemza	110	0	0%
	12. Arevik	517	0	0%
	13. Isahakyan	307	0	0%
	14. Jrapi	305	0	0%
	15. Norshen	255	0	0%
	16. Shirakavan	216	0	0%
Tavush	17. Baghanis	241	0	0%
	18. Bagratashen	355	0	0%
	19. Barekamavan	78	0	0%
	20. Gandzakar	700	0	0%
	21. Haghartsin	959	959	100%
	22. Sevqar	700	0	0%
	23. Vazashen	240	240	100%
	24. Verin Karmir Aghbyur	550	0	0%
Vayots Dzor	25. Gladzor	436	0	0%
	26. Rind	516	0	0%
Total	26	12,736	1,199	9.4%

Effectiveness indicators describing the status of the DWS sub-component implementation are presented in the table above. Once the implementation of the abovementioned 2 projects ended, the whole local population became beneficiaries of the sub-component. In the meantime, the lion's share of the sub-component implementation is yet pending as of the moment of the IA implementation.

(ID62). Effectiveness of social (water) infrastructure (RIMS Ranking from 1 to 6, to be assessed considering: % of delivered vs. required water; # of households with secure access to water; increased service level). Similar to the calculation of the previous effectiveness indicator, the extent of the water supply in terms of volume of supplied water, accessibility for local population, and service level has been assessed again for only 2 communities with completed DWS projects.

Table 59 - Effectiveness of social (water) infrastructure

		Total
1.	Required water (cubic meter/day)	1,460
	Delivered water (cubic meter/day)	1,183
	% of delivered vs. required water	81%
2.	Total number of households	1,199
	Number of households with access to water	1,199

	Share of households with secure access to water	100%
3.	Water supply after RACP (2016) (hour/day)	15.9
	Water supply before RACP (2010) (hour/day)	4.3
	Increased service level (hour/day)	11.6

Positive dynamics in terms of all three sub-indicators is obvious. Major part of the objectives has been achieved.

(ID81) Groups managing social infrastructure strengthened (water supply operators). (ID82) People trained in infrastructure management (WASH campaigns). Strengthening of the social infrastructure management groups was initiated in 4 communities. In 2 of them the process has been completed; in other 2 it is in process and will finish in accordance with the assigned time schedule. Wastewater and solar heating awareness campaigns have been conducted in all 22 communities targeted by the sub-component in prior.

5.2.2 Impact

(ID1). Number of rural people living on < USD 4.30/day (Percent). This indicator suggested for the measurement of poverty in selected rural communities is applicable for the assessment of the DWS sub-component implementation with major reservations. The sub-component mainly aims at social aspects of the local population's livelihood and the expected economic impact is limited to a small scale growth in backyard agricultural production and some increase in productivity of animal husbandry activities.

Table 60 - Number of rural people living on less than \$4.30 per day

	Households	People
Total number of surveyed respondents	89	434
Number of people living for less than \$4.3 per day	77	390
Share of people living for less than \$4.3 per day in total	86%	90%

The share of poor population in selected 2 communities is very high. There is a number of explanations for such bothering situation in those communities. The major reasons, however, are the following: a) one of communities is bordering to Azerbaijan and has very limited opportunities for development, most of lands are under the weapon fire from the side of the neighboring country and farmers simply cannot cultivate their lands; and b) the other community is surrounded with massive forests and simply does not have sufficient lands for intensive agricultural activities.

Implementation of the DWS sub-component in such bothering circumstances became of special importance for local beneficiaries. Despite the positive change is not too big in absolute means, it remains important and appreciated by local farmers. They use the water for irrigation of their backyard orchards intensively and already had a chance to tangibly benefit from increased production volumes of 2015.

(ID2). Increase of household asset ownership in communities benefiting from RACP activities (Percent). 90% of beneficiaries of the RACP DWS sub-component registered increase of assets (in type, quantity, or value). In order to measure the change, the assets of beneficiaries may be conditionally divided into 2 groups: business (agricultural land, domestic animals, agricultural machinery, etc.) and household (house, passenger car, furniture, etc.) assets. Changes in asset ownership is presented below.

Table 61 - Increase of household asset ownership

Types of assets	Own the assets	Procured the assets in the recent 5 years	Procurement value, \$ ¹⁴	Average procurement value per 1HH, \$
	A	B (= % in A)	C	D
Land plot	100%	4%	6,045	68
Cattle, sheep and goats, pigs	65%	62%	11,460	198
Beehives	13%	42%	1,456	121
Cowshed	85%	8%	8,003	105
Agricultural machinery	6%	40%	8,321	1,664
Vehicle	16%	64%	31,620	2,259
Greenhouse	1%	100%	1,224	1,224
House	97%	2%	27,802	323
Passenger car	43%	55%	61,821	1,627
Furniture	98%	24%	16,995	195
TV set	99%	27%	8,257	94
Washing machine	90%	58%	16,180	202
Refrigerator	94%	38%	14,807	176
Water heater	60%	62%	4,672	88
Heating system	10%	67%	3,071	341
Gas stove / oven	83%	20%	4,094	55
Internal system of drinking water supply	73%	26%	3,671	50
Total			229,500	2,579

87% of beneficiaries registered increase of household assets vs. 58% of households that registered increase in business assets. The most frequently procured household assets were washing machines, refrigerators, water heaters (and heating systems) and cars. Notable part of respondents renewed also their internal systems of DWS. In case of business assets, the most often met assets were various domestic animals. Interestingly, investments in business infrastructure became observable (such as investments in cowshed, machinery, greenhouses, etc.). **Average increase of the value of (all) assets per beneficiary in the period of 2010-2016 comprised \$2,579** (according to the respondents' estimation/valuation (based on actual procurement prices) of their assets).

It is very hard to conduct the attribution of the increase of HH assets to the implementation of the DWS sub-component. Respondents were simply unable to provide any justified options in this regard. The IA team should have based its conclusions on rather legitimate, reasonable, but subjective judgments. Some changes can be fully (or to a large extent) and directly attributed to the implementation of the DWS sub-component. Those are renewal of internal DWS systems, procurement of new washing machines and water heaters. The improvement of the infrastructure contributed to some extent to the increase of the number of cow head, which is explained by the fact the rural HHs now have the opportunity to water their animals during wintertime when they are in the barns. Availability of water increases milk productivity.

(ID38). Household Assets Ownership Index of targeted population (*Percentage (to be reported as share of targeted households with improvement in household asset ownership, disaggregated by male and female headed households)*). Some assumptions should be made on definition/identification of man or woman headed HH. In most of HHs decisions are being made mutually, by man and woman ruling the HH. The findings in regard of this indicator are rather obvious, self-explanatory and do not need further detalization.

¹⁴ Respondents mentioned prices in AMD. For converting into USD the IA implementation team applied the exchange rate of \$1=408.6 AMD, which was calculated to be the average value for the period of 2010-2016

Table 62 - Households with improvement in household asset ownership

	Household Assets Ownership Index		
	Total Assets	Business Assets	Household Assets
Share of HHs that registered any increase of assets in 2010-2016, o.w.	89.9%	58.4%	86.5%
- In male headed HHs	92.9%	64.3%	85.7%
- In female headed HHs	88.5%	55.7%	86.9%

(ID3). Increase in income for target households participating in the Programme activities (Percent).

None of surveyed households had/shared comprehensive information on the size of their income. The reasoning of such negative finding is the following:

- There is no practice/culture/habit of keeping records on income among surveyed households. Figures they tell are usually approximate and incomplete. People tend to forget Irregular (one time) and small income. Bigger than usual (also one-time/irregular) income they prefer not to mention, at all.
- Information about agricultural income is also incomplete and approximated. Part of agricultural produce is being consumed within the households for subsistence purposes. Most of farmers do not equal/identify that consumption as income. Some produce is being sold, including the barter, which is not being evaluated in monetary means, either. Finally, a certain quantity of agricultural products is being processed for further sales or consumption, farmers tend to skip that volume, too.

On contrary, people used to be more cautious while talking about expenses, thus, the provided information is more accurate. In such cases, it is widely accepted to justify the value of income indirectly, via application of the amount of expenses. The basic (rough) assumption is that amount of income plus savings should at least total to the amount of expenses. This method was applied also for the justification of the information provided by respondents; the justified amount was included under the row of “*Other sources*”.

Table 63 - Size and structure of beneficiary households' income

	Income					
	After RACP (2016)		Before RACP (2010)		Change	
	USD	Share	USD	Share	USD	%
Total income of surveyed beneficiary households, including proceeds from:	580,082	100%	421,915	100%	158,168	37%
- Agriculture	70,346	12%	67,482	16%	2,864	4%
- Work remuneration	91,331	16%	54,249	13%	37,083	68%
- Self-employment	7,110	1%	2,937	1%	4,173	142%
- Rent of assets by others	0	0%	0	0%	0	-
- Work migration of household member	80,164	14%	92,829	22%	-12,665	-14%
- Relatives and friends	2,843	0%	1,796	0%	1,046	58%
- Pensions and allowances	113,781	20%	63,655	15%	50,126	79%
- Other sources	214,508	37%	138,966	33%	75,542	54%

In the period of RACP implementation, overall **income of DWS sub-component beneficiaries' households grew for 37%**. This is a quite notable increase in the amount of income especially for such disadvantaged villages as those addressed by the DWS sub-component. In the meantime, we should be cautious with attribution of that increase. Substantial part of the income increase was ensured via increases in spheres not much related to drinking water supply, such as remunerations from permanent employment, pensions, etc. Rehabilitation of the DWS infrastructure notably contributed to the increase of income from agriculture (that otherwise may even decrease), via increasing the productivity of milking cows.

Table 64 - Increase in income

	Income, USD			Increase in income
	After RACP (2016)	Before RACP (2010)	Change	
Total income of surveyed households	580,082	421,915	158,168	37%
Average income per household	6,518	4,741	1,777	

In the meantime, not all the surveyed households registered increase in income in the period of 2010-2016. Actual increase is registered only with 82% of surveyed households; in case of remaining 18% there was a decrease of income.

Table 65 - Change in income

	Change in income			
	Increase	No change	Decrease	Total
Share of beneficiaries	82%	0%	18%	100%
Amount of change	199,287	0	-41,119	158,168
Change per household, \$	2,730	0	-2,570	1,777

The table above shows that income generated from almost all sources of income grew; the only exception was income from work migration. 14% decrease in amount of income from work migration and in its share in total amount of income is registered. This may have different reasons: aging of work migrants, economic crisis in Russia (major destination for work migration), cut-off of the amounts earned in work migration, etc. Exactly this major cut-off of the proceeds from work migration conditioned the negative change in income for 18% of surveyed beneficiaries.

(ID33). Household Incomes by gender (cash and non-cash). Including but not limited to income from agriculture, livestock, employment, etc. (USD/annual average). Traditional specificities of Armenian reality should be taken into account for the segregation of HH income by gender. Some part of HHs' income is being generated **by personal activities of HHs' certain members**. The other part of the HHs' income is being generated via **collective activities of several or all members of HHs**.

Table 66 - Household Incomes by gender

	Total number of HH members	Of which, having own (personal) income		Total amount of income, \$/annual*	Per capita income, \$/annual
		Person	%		
Male	211	88	42%	144,633	1,644
Female	223	78	35%	76,052	975
Total	434	166	38% (weighted average)	220,685	1,329 (weighted average)

* - Information was collected in AMD. Conversion was made at the average exchange rate for 2016 - \$1=480 AMD, since this is about current income

The survey of the DWS sub-component beneficiaries revealed that 38% of respondents' HHs members are engaged in one of income generation occupations. Male members of the surveyed HHs ensure 66% of total income generated; respectively the share of income generated by female members comprises 34%. In other words, male population generates more income than females.

Other benefits conditioned by the implementation of the DWS sub-component of the RACP. Implementation of the DWS sub-component primarily targeted the improvement of the livelihood of farmers with some indirect positive impact also on agricultural activities in terms of the increase of domestic animals' (cows) milk productivity the following positive changes should be mentioned.

Table 67 - Other positive implications of the RACP implementation

Implications	Share of respondents
Hygienic issues are being resolved/fended easier	75%
HHs received an opportunity to use automatic washing machines	62%
HHs received an opportunity to use heating systems for heating their houses	20%
HHs received an opportunity to use water heaters and consume hot water in their houses	47%
HHs receive some economic benefits such as watering their homestead lands	100%

As it can be concluded from the information presented in the table above, rehabilitation of the DWS infrastructure first of all (directly and indirectly) influenced the livelihood of farmers. They started saving time on washing of clothes, received access to hot water (which was limited and sometimes even dangerous before), started affording equal heating of the housing facilities, etc.

(ID34). Household expenditures by type (USD/annual average). Size and structure of surveyed HH expenditures may provide a lot of information about their livelihood standards. The higher is their income level, the bigger and more sophisticated is the consumption size and structure. Normally, poorer HHs spend more (proportionally in total income) on everyday needs (food, clothing, utilities), while more secured HHs allocate more funds (again proportionally) for other purposes (entertainment, travel, investments in business, etc.) In the meantime, there are some local specificities that should be necessarily taken into account in the Armenian context. Some of them are the following:

- Armenians relation to education - every Armenian family prefers to cut all expenses, but ensure education of children,
- Demographic situation in remote villages - prevalence of elder people that causes healthcare expenditures and such costs are absolutely non-elastic,
- “Innovations” - in the recent period of 5 years relatively new expenditure rows appeared in the budgets of local HHs, such as internet, insurance of cars/vehicles, traffic rules violation fees, etc.
- Demand for sophisticated items of consumption (such as travel, leisure in abroad, expensive household items, regular participation in cultural events, etc.) is traditionally low.

Table 68 - Household expenditures by type

Expenditures	Expenditures, \$				Change	
	After RACP (2016)		Before RACP (2010)		\$	%
	Total	Per 1HH	Total	Per 1HH	Per 1HH	
Total	510,920	5,740	341,565	3,837	1,903	50%
▪ Livelihood expenses	451,173	5,069	297,555	3,343	1,726	52%
- Food	152,466	1,713	125,483	1,410	303	22%
- Clothing and shoe	33,289	374	29,336	330	44	13%
- Electricity	16,536	186	11,373	128	58	45%
- Gas	16,163	182	12,060	136	46	34%
- Fuel-wood	18,111	203	13,840	156	48	31%
- Drinking water	104	1	102	1	0	2%
- Phone and internet	17,577	197	8,188	92	105	115%
- Public transport	5,728	64	4,619	52	12	24%
- Fuel for own car	13,559	152	10,509	118	34	29%
- Education	8,601	97	4,764	54	43	81%
- Healthcare	36,848	414	16,961	191	223	117%
- Other household expenses	20,531	231	15,267	172	59	34%
- Leisure and entertainment	1,077	12	844	9	3	28%
- Travel	0	0	489	5	-5	-100%
- House maintenance and repair	11,406	128	5,984	67	61	91%
- Car maintenance and repair	11,968	134	5,164	58	76	132%
- Asset tax, insurance, fees	5,160	58	2,109	24	34	145%
- Loan principal and interest	44,901	505	7,695	86	418	484%
- Events	37,150	417	22,768	256	162	63%
▪ Business costs for self-employment	1,762	19	979	11	9	80%
▪ Agricultural activities' costs	57,985	652	43,031	483	168	35%
- Land cultivation costs	12,051	135	7,743	87	48	56%
- Animal husbandry costs	45,933	516	35,288	396	120	30%

Increase in the amount of almost all expenditures is obvious. The major reason for this is the inflation - prices of all products and services should have increased and did. Average annual inflation rate in Armenia in the

recent period of 5 years varied around 5-7% despite several cases of unexpected and critical jumps (as it happened in December 2014). The second reason is, however, the change in surveyed HHs livelihood.

We would like to address the change in only one expense row - loan repayment. Back in 2010 this expense item was not a notable one and comprised quite a small amount compared to shares of major expense items, such as food, clothing, events, healthcare, etc. In 2016, the portion of loan repayment became very high; it is the second after food. Partially, this phenomenon can be explained by increase of expenditures on land cultivation and animal husbandry (and funded by (mainly short-term) loan proceeds), since the major financial product available for those farmers are agricultural loans offered by a number of banks and UCOs in rural areas of Armenia.

(ID53). Production processing by type (Volume and value). Measurement of the change in processing of agricultural products was included in the assessment of the DWS sub-component based on the assumption that improved water supply may have created better conditions and opportunities for value chain development and production of higher value products. Importantly, this relates both to the processing of land cultivation and animal husbandry products. However, before passing to the analysis of the volumes of different products' processing, some reservations should be made:

1. Primary and processed agricultural products are not homogenous and comparisons between different products may not be relevant. In other words, comparing volumes of wheat flour (processed wheat) and wine (processed grape) is good for nothing. This means, there is no reason and meaning in identification of privileged processed products.
2. Some processing is being made still for HHs' own subsistence consumption and does not yet mean a process of additional value generation. The best examples are again the milk processing into cheese/matsoun or wheat processing into flour (used for internal consumption almost exclusively).

Table 69 - Production processing by type

	After RACP (2016)				Before RACP (2010)				Change	
	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Value per HH, \$/HH
Total	85	-	22,733	267	79	-	18,727	237	8%	13%
▪ Land cultivation products	81	6,344	2,590	32	76	5,633	2,105	28	7%	15%
- Wheat	0	0	0	-	0	0	0	-	-	-
- Other cereals	0	0	0	-	0	0	0	-	-	-
- Legumes	33	661	443	13	31	624	406	13	6%	3%
- Technical crops	0	0	0	-	0	0	0	-	-	-
- Potato	0	0	0	-	0	0	0	-	-	-
- Cabbage	7	135	45	6	7	145	53	8	0%	-14%
- Cucumber	54	1,261	517	10	47	1,051	430	9	15%	5%
- Tomato	22	582	172	8	17	449	142	8	29%	-6%
- Eggplant	1	5	1	1	0	0	0	-	-	-
- Pepper	2	30	18	9	2	30	18	9	0%	0%
- Carrot	0	0	0	-	0	0	0	-	-	-
- Onion	1	5	4	4	1	5	4	4	0%	0%
- Garlic	0	0	0	-	0	0	0	-	-	-
- Watermelon	0	0	0	-	0	0	0	-	-	-
- Melon	0	0	0	-	0	0	0	-	-	-
- Apple	5	145	52	10	5	95	32	6	0%	63%
- Pear	3	29	20	7	3	70	26	9	0%	-26%
- Apricot	0	0	0	-	0	0	0	-	-	-
- Peach	0	0	0	-	0	0	0	-	-	-
- Sweet cherry	1	5	6	6	1	20	24	24	0%	-75%
- Cherry	3	55	22	7	3	45	16	5	0%	38%

	After RACP (2016)				Before RACP (2010)				Change	
	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Value per HH, \$/HH
- Plum/prunes	24	1,135	457	19	30	1,747	387	13	-20%	48%
- Nuts	0	0	0	-	0	0	0	-	-	-
- Persimmon	2	60	24	12	2	40	17	9	0%	43%
- Fig	10	136	82	8	8	85	52	7	25%	27%
- Berries	12	255	148	12	8	222	165	21	50%	-40%
- Grapes	18	1,845	578	32	12	1,005	333	28	50%	16%
▪ Animal husbandry products	37	-	20,143	544	33	-	16,623	504	12%	8%
- Milk	37	40,470	20,099	543	33	32,020	16,608	503	12%	8%
- Meat	2	11	44	22	1	3	15	15	100%	50%

As it can be seen in the table above, notable positive change (of about 10% and more) in processing volumes is registered for the great majority of crops and products, though the absolute volumes of their production are not very big. Few exceptions (i.e. decrease in production volumes) (such as in case of meat, plum/prunes, pear) are not of notable volumes and importance. Respectively, few cases of decrease in processing volumes are also of not big volumes. In the meantime, it should be noted that number of HHs that apply processing of agricultural products increased even if the processing volumes decreased. In other equal conditions, this may be interpreted as subsistence consumption of in-house processed products in more HHs, since volumes of processing are not sufficient for commercial use.

It is important to note that major part of changes presented in the table above cannot be attributed to the implementation of the DWS sub-component. **The major component that can be partially attributed to the Project is increase of the processing volumes of animal husbandry products.**

(ID56). Livestock and poultry (Number by type). Majority of the DWS sub-component beneficiaries is engaged in animal husbandry activities (of all types) and their share grew from 81% before the RACP to 85% after the RACP, i.e. **the number of HHs engaged in animal husbandry grew for 5.6%**. On average, the HH engaged in animal husbandry breeds 3 types of domestic animals, with poultry activities in leading position. Cattle breeding is developed among less number (the third in turn) of farmers.

Table 70 - Livestock and poultry

Types of animals	After RACP (2016)			Before RACP (2010)			Change	
	HHs share in total	Livestock, head	Livestock per 1 HH, head/HH	HHs share in total	Livestock, head	Livestock per 1 HH, head/HH	HHs share in total	Livestock per 1 HH, head/HH
Cattle, of which...	49%	131	3.0	45%	95	2.4	10%	25%
Cows	46%	67	1.6	45%	58	1.5	3%	13%
Sheep	4%	79	19.8	2%	63	31.5	100%	-37%
Goat	1%	2	2.0	1%	15	15.0	0%	-87%
Pig	56%	184	3.7	48%	157	3.7	16%	1%
Chicken	65%	699	11.5	62%	622	11.3	5%	1%
Beehive	13%	43	3.6	10%	51	5.7	33%	-37%
Horse, donkey	10%	19	2.1	12%	13	1.2	-18%	79%
Goose	2%	30	15.0	1%	20	20.0	100%	-25%

The following changes presented in the table above are noteworthy:

- Increase of cattle bred by surveyed HHs is partially (not to a large extent) conditioned also by the improvement of the DWS. Despite the recent decline of milk prices throughout Armenia in 2015, the demand for fresh milk is stable, especially in the period of intensive procurements by cheese processing companies;

- Notable decrease of the livestock of sheep is not connected with the project, at all. The major reason for that decrease is the drastic jump in prices of mutton and live sheep that started few years ago (due to external demand from Arabic countries) that resulted in downscale of the livestock number in a short run. Most probably, the livestock will grow again, but that growth also will not be much related to the DWS.

(ID57). Productivity of livestock and poultry by type (Volume/annual average). Productivity of domestic animals is at least as important indicator as the number of livestock. Moreover, in many cases increase of productivity is more preferable due to a number of reasons. The following table shows the change in productivity of different domestic animals in the assessed period.

Table 71 - Productivity of livestock and poultry by type

Animals	After RACP (2016)	Before RACP (2010)	Change
Cows' milk productivity, liter/year	1,348	1,191	13%
1-year fed calf/bull meat productivity, kg/head	65	67	-3%
2-year fed calf/bull meat productivity, kg/head	123	129	-5%
6-month fed pig meat productivity, kg/head	51	51	0%
8-month fed sheep meat productivity, kg/head	13	13	0%
Chicken egg productivity, egg/year	170	114	49%
Beehive honey productivity, kg/hive	21	16	31%

It is good to register that productivity increase took place for the most important product - milk in the assessed period. This change is partially conditioned by the improved availability of drinking water supply in surveyed HHs. Farmers ensured more and better drinking water for cows that, in line with other factors, resulted in increase of milk productivity. Other changes in productivity are rather very small in absolute volumes, or have no or very limited relation to the improvement of the DWS.

(ID58). Expenditures on livestock by type (\$/HH average annual). Types and intensity of expenditures are in direct correlation with the overall productivity features. *Ceteris paribus*, the more money farmers spend for animal husbandry purposes the better results they should get, the higher should be the productivity, the more should be the produce. However, there are some external factors that may substantially affect and change that rule, as in case of climatic force-majeure. Expenditures made by surveyed farmers for their animal husbandry activities are presented below.

Table 72 - Animal husbandry expenditures by type

Expenditures	After RACP (2016)		Before RACP (2010)		Change
	For all HHs, \$/annual	For 1 HH, \$/annual	For all HHs, \$/annual	For 1 HH, \$/annual	
Animal feeding (bought, of all types)	34,842	458	27,574	383	26%
Animal healing (medicaments and veterinary services)	1,058	14	1,008	14	5%
Shepherd remuneration	2,971	39	1,796	25	65%
Transportation	2,986	39	2,643	37	13%
Workers remuneration (grass harvest, loading, unloading, shelving)	2,347	31	1,309	18	79%
Agricultural machinery and equipment	1,728	23	957	13	81%
Total	45,933	604	35,288	490	30%

Expenses of almost all types of animal husbandry increased in the recent period. The biggest changes were registered for the expenses on the application of agricultural machinery and remuneration of hired workers. However, those expenses have the smallest share in total. The biggest scale of influence took place for the expenses on animal feeding where the change is quite notable, too. Increases in the expenses presented above come to partially justify also the increase of the productivity observed for almost all animals. In the meantime, it is necessary to mention that increases presented above can be attributed to the implementation of the DWS sub-component to a very limited extent.

(ID65). Household member/members in charge of collecting water (number). Insufficient supply of drinking water and respective consequences are exactly the issues targeted by the DWS sub-component. Collection of water was the biggest problem for HH members. That is why, the registered positive changes are really appreciated by local inhabitants. Dynamics of involvement of HH members in those activities is presented below.

Table 73 - Household member/members in charge of collecting water, share in total

	After RACP (2016)	Before RACP (2010)	Change
Share of HHs collecting drinking water from sources outside of their houses	0%	73%	100%
Share of HH members collecting water from sources outside of their houses	0%	35%	100%
Average number of HH members involved in collection of drinking water from sources outside of their houses (person per 1 HH), of which:	0.00	1.69	100%
- Men	0.00	0.42	100%
- Women	0.00	0.99	100%
- Children	0.00	0.28	100%

Conditional coefficient of involvement of HHs and their members in collection of water improved drastically and completely due to implementation of the DWS sub-component. This left its positive effect especially on women, who were mainly in charge for the water collection.

(ID66). Time spent for water collection (hour). The coefficient mentioned in the last paragraph is somewhat artificial since it provides cumulative involvement of all HH members. In the meantime, involvement of adult members of the HHs should be reviewed also from the viewpoint of alternative costs. The time spent on collection of drinking water could be alternatively used for income generation.

Table 74 - Time spent for water collection

	After RACP (2016)	Before RACP (2010)	Change
Time spent by HH members for collection of drinking water from other sources (hour/day per 1 HH), of which:	0.00 (0 minute/day)	1.15 (69 minute/day)	100%
- Men	0.00	0.24	100%
- Women	0.00	0.74	100%
- Children	0.00	0.17	100%

The indicator of time spent for drinking water collection improved significantly. The saving of HHs adult members' time comprised 58 minutes per day or about 44 days a year. In other equal conditions, the monetary value of savings of adult members' time comprised about 220,000 AMD annually¹⁵.

(ID67). Total water used by HH in liter per day (m³). Implementation of the DWS sub-component aimed at the improvement of the accessibility of drinking water. Consequently, improved accessibility should ensure intensification of the use of drinking water for various purposes. That dynamics is presented below.

Table 75 - Total water used by HH

	After RACP (2016)	Before RACP (2010)	Change
Daily volume of drinking water used by HHs (m³), of which:	0.610	0.330	84%
- Used for HH needs	0.214	0.127	68%
- Used for irrigation of homestead lands	0.350	0.176	98%
- Used for animals drinking	0.042	0.027	55%

¹⁵ Labor cost per day is 5,000 AMD

Increase of the volume of drinking water used by HHs of surveyed communities is significant; the volume of use increased about twice. That is especially notable in case of the water used for irrigation of homestead lands. In a longer run, this will bring to better productivity and increased agricultural production. All the mentioned changes may be attributed to the implementation of the DWS sub-component almost completely.

(ID68). Health problems (diarrhea, stomach virus, dysentery, etc.) (Number of cases). Diseases related to drinking water quality are common problem for all areas with old and obsolete DWS infrastructure. Among others, that factor also played a role for making a decision on involvement of certain communities in the DWS component implementation list. Dynamics of the most common diseases is rather unambiguous.

Table 76 - Change in number of diseases

Diseases	After RACP (2016)		Before RACP (2010)		Change
	Number of cases	Number of cases per 1 HH	Number of cases	Number of cases per 1 HH	
Diarrhea	14	0.15	82	0.92	-82%
Dysentery	0	0.00	0	0.00	-
Vomiting	8	0.08	44	0.49	-81%
E. coli	0	0.00	0	0.00	-
Salmonella	0	0.00	0	0.00	-

Obvious positive dynamics is quite promising. However, the intervention should not stop on the current level of achieved results, since there is still a good room for further improvement of the quality of servicing.

(ID70). Potential for Improved water supply for backyards irrigated with domestic water (Ha of backyard to be irrigated with domestic water). As it was already mentioned, intensified use of drinking water for the irrigation of backyard areas (homestead lands) is among the major achievements of the DWS sub-component implementation. Dynamics of that indicator is presented below.

Table 77 - Backyard irrigated with drinking water, ha

	After RACP (2016)	Before RACP (2010)	Change
Backyard area irrigated with drinking water (total for all HHs), including:	3.54	2.39	48%
Backyard area irrigated with drinking water (per 1 HH), including:	0.040	0.027	48%

100% of HHs in targeted communities use the drinking water for irrigation of backyards. They have no alternative to that since there is no sufficient irrigation opportunity. Another reason for drastic growth of the volume of used water (e.g. in Vazashen) is the absence of water meters. This is a remote and bordering community that is granted special privileges, including exclusion of local taxes and fees. Payments for the used drinking water were excluded, too. All the costs are being covered by the community budget. Thus, there is no need for installation of water meters.

(ID79). Improved agricultural and livestock production (a) number of farmers reporting production/yield increase; b) number of farmers adopting recommended technologies). Improvement of agricultural production was already addressed above, under the first impact indicators addressing the share of poor people in targeted communities. As it was mentioned, the improvement is notable, although it had just one season to appear, i.e. the benefits are expected to grow further. Importantly, the improvement of production is registered both in land (backyard) cultivation and animal husbandry. Providing no other major changes happened in the surveyed communities, the registered change can be to a very large extent be attributed to the implementation of the DWS sub-component.

Table 78 - Effectiveness: Improved agricultural and livestock production

	Crop production (in backyards)		Livestock production	
	Farmers	%	Farmers	%
Number of farmers	89	100%	77	100%
Number of farmers having increased their production	36	40%	27	35%

(ID92). Rural Enterprise Development and employment Effectiveness: creation of employment opportunities (Number of new jobs created). Despite the social nature of the DWS sub-component it also aimed at introduction of new business opportunities. This IA team addressed this issue with the stakeholders of all communities targeted by the sub-component. Importantly, all expectations are very positive both in terms of intensification of already existing businesses and from the prospective of new business establishment. In the meantime, the IA team should follow the general logic of registering dynamics in only those communities having completed DWS projects. From this viewpoint, no change is registered. In the surveyed 2 communities of Vazashen and Haghartsin no real impact in terms of rural business development and creation of new employment opportunities have been identified, so far.

5.2.3 Sustainability

(ID63). Likelihood of sustainability of Social Infrastructure (*RIMS Ranking from 1 to 6, to be assessed considering: # of functioning domestic water supply systems; water meters installed*). According to the IFAD RIMS, the sustainability of DWS systems can be measured only if they have been fully constructed and/or rehabilitated during the period under review. As of the moment of the IA implementation rehabilitation projects have been completed and handed over in only 2 communities.

Table 79 - Likelihood of sustainability of Social Infrastructure

		Total
1.	Total number of households	1,199
	Number of functioning domestic water supply systems	1,199
	Share of functioning domestic water supply systems	100%
2.	Total number of households	1,199
	Number of water meters installed	0
	Share of households with water meters installed	0%

Assessment of the likelihood of sustainability of the DWS infrastructure may seem to be somehow inflated at first site. But actually, it is not. All the HHs of surveyed communities became beneficiaries of the DWS sub-component implementation, but none of them installed water-meters, so far. This is largely conditioned by location of those communities and their socio-economic status. The Government adopted the strategy of providing remote and bordering communities with special status. These communities enjoy privileged and favorable conditions for several aspects, including also for the payments for utility services. As it was explained to the IA team by local authorities, wherever possible, the State (represented by local municipalities) undertook the responsibility of paying for communal costs. Providing that in both communities the servicing of the DWS systems is being conducted by the Municipality, it is their right to make decision on covering all costs for the DWS on behalf of local population.

(ID69). Operation and Maintenance (O&M) organizations / groups. Problems with O&M (Type/Number). Any infrastructure requires O&M measures and expenses over the period of exploitation. Properly organized O&M guarantees the sustainability of the infrastructure work and long lasting exploitation. O&M issues may conditionally be divided into the following two major aspects: a) availability of O&M service providers and b) affordability of O&M costs. These O&M issues in surveyed communities with completed DWS projects is the following.

Table 80 - Beneficiaries' awareness on DWS system O&M

Questions	Beneficiaries' responses			
	Yes	No	Do not know	Total
Do you have an Operation and Maintenance (O&M) organization servicing your DWS system?	66%	33%	1%	100%
↓				
Do you know the name of the O&M organization?	95%	5%	-	100%
↓				
Please provide the name of the O&M organization:				
- Know only the name of the O&M organization representative	73%			
- Municipality	27%			

Majority of surveyed beneficiaries is aware of the availability of the provision of O&M services, i.e. they know that there is such organization (i.e. Municipalities took the responsibility of conducting respective functions) that provides (or should provide) O&M services. Interestingly, for the majority of beneficiaries the O&M service providers are identified with specific persons, not an organization. However, it is understandable that in small rural communities' consumers do not name the organization, but a person delivering services on behalf of that organization.

Beneficiaries resolved problems they faced during the exploitation of the DWS system as follows: a) applying to the O&M organization, which sent specialists that came and repaired the system; b) invited an individual master; and c) resolved problems by themselves.

The scale of problems that happened in both communities is not big. The problem of servicing the DWS system was resolved with quite a small amount of money. Problems with DWS equipment have been of larger scale, but happened to a limited number of beneficiaries. However, in both cases the Municipalities properly implemented their O&M functions.

(ID86). Likelihood of sustainability of groups managing social infrastructure strengthened (RIMS Ranking from 1 to 6, to be assessed considering: Number of operational water supply companies; fee collection rates). Assessment of this indicator also can be done only for 2 communities with completed DWS projects. In both communities, the management of DWS infrastructure is being conducted by local municipalities. Assessment of other sub-indicators is presented below.

Table 81 - Likelihood of sustainability of groups managing social infrastructure¹⁶

		Communities
1.	Number of operational DWS companies	1
2.	Rate of DWS fee collection	N/A
3.	Availability of facilities for the DWS company	Yes
4.	Availability of technical means for servicing	Sufficient
5.	Availability of professional staff at the DWS company	Sufficient
6.	Availability of funding at the DWS company	Sufficient

The presented assessment is largely self-explanatory. The only comment that should be made relates to the rates of fees. It was presented that both municipalities undertook the responsibility of costs of the DWS in their communities and local population does not pay for the water they consume. Instead, local HHs collect a small annual amount of several hundred AMD for minor servicing of the DWS system.

¹⁶ As per information provided by Mayors of Vazashen and Haghartsin

5.2.4 Other Issues

(ID26). People/HHs in target area (Number). Total number of HHs in the targeted 26 communities of the DWS sub-component implementation comprises 12,736, and the number of population is 50,928 persons. Distribution of those figures by communities is presented below.

Table 82 - People/HHs in target area

Marz	Community	HH	Population
Aragatsotn	1. Aragatsavan	1,975	7,899
	2. Arteni	760	3,040
	3. Lusagyugh	270	1,081
	4. Nor Yedesia	353	1,410
	5. Shenavan	425	1,699
Gegharkunik	6. Ttujur	293	1,170
Lori	7. Chochkan	490	1,960
	8. Dsegh	860	3,440
	9. Katnajur	528	2,110
	10. Mets Ayrum	297	1,188
Shirak	11. Anipemza	110	439
	12. Arevik	517	2,066
	13. Isahakyan	307	1,226
	14. Jrapi	305	1,220
	15. Norshen	255	1,019
	16. Shirakavan	216	862
Tavush	17. Baghanis	241	964
	18. Bagratashen	355	1,420
	19. Barekamavan	78	312
	20. Gandzakar	700	2,800
	21. Haghartsin	959	3,836
	22. Sevqar	700	2,800
	23. Vazashen	240	960
	24. Verin Karmir Aghbyur	550	2,200
Vayots Dzor	25. Gladzor	436	1,744
	26. Rind	516	2,063
Total		12,736	50,928

Source: RAED PIU database

(ID27). Average HH size (Number). Size of HHs in the target area is a very important indicator that not only describes the social status and composition of beneficiaries' families, but is also being used in calculation of many other important indicators, such as per capita income and expenditures. Good ground for comparisons may serve the average figures for HH members in Armenia that varies around the coefficient of 4 persons per HH.

Table 83 - Average HH size

Number of HH members	HHs		Total number of HH members, persons	Average number of HH members, person/HH
	Number	Share		
1 person	3	3%	3	↓
2 persons	9	10%	18	
3 persons	8	9%	24	
4 persons	14	16%	56	↓
5 persons	20	22%	100	
6 persons	18	20%	108	
7 persons	14	16%	98	

Number of HH members	HHs		Total number of HH members, persons	Average number of HH members, person/HH
	Number	Share		
8 persons	2	2%	16	↓
9 persons	0	0%	0	
10 persons	0	0%	0	
11 persons	1	1%	11	
Total	89	100%	434	4.88

The average number of HH members in surveyed communities **notably exceeds** the average figure for Armenia. This phenomenon has the following main explanation in case of the DWS sub-component beneficiaries HHs. Traditionally, the HHs in rural areas of Armenia are bigger than in urban places. People used to have more children in villages than in cities. The number of HHs with more than 6-7 persons (1 family) is very small in these communities, and there is no need for being addressed separately.

(ID28). Age (Classification into categories) and (ID29). Gender (Male/female). Information on age distribution of surveyed HHs members is largely self-explanatory. Just one important conclusion can be derived: exactly half of the surveyed HHs members are in the workable age of 20-60 years old. This means that there is no (and is not expected) lack of productive workforce to exploit the constructed/rehabilitated infrastructure.

Table 84 - Age

HH members age groups	Total number of HH members	
	Person	Share
0-4	27	6.2%
5-9	31	7.1%
10-14	45	10.4%
15-19	26	6.0%
20-24	26	6.0%
25-29	27	6.2%
30-34	35	8.1%
35-39	30	6.9%
40-44	30	6.9%

HH members age groups	Total number of HH members	
	Person	Share
45-49	24	5.5%
50-54	22	5.1%
55-59	23	5.3%
60-64	31	7.1%
65-69	17	3.9%
70-74	11	2.5%
75-79	10	2.3%
80+	19	4.4%
Total	434	100.0%

The survey of beneficiaries' HHs revealed that proportions of population by gender are almost equal with a very slight prevalence of male population. From the viewpoint of income generation this does not mean anything; currently most of women are equally engaged in economic activities as men. Moreover, usually they take also housekeeping responsibilities over the income generation activities. Interestingly, this information does not reflect the permanent situation in surveyed communities. In the period of March-November a notable part of male population used to leave their HHs for the work migration.

Figure 9 - Gender

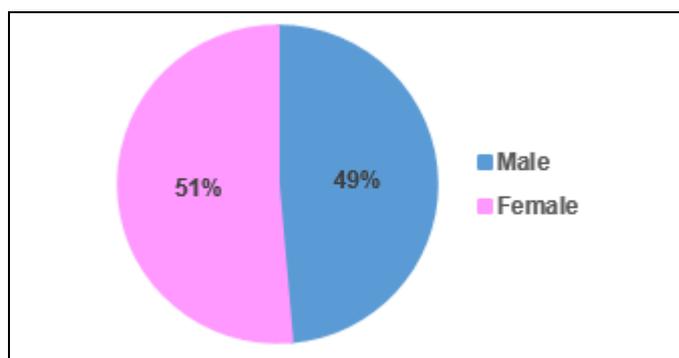
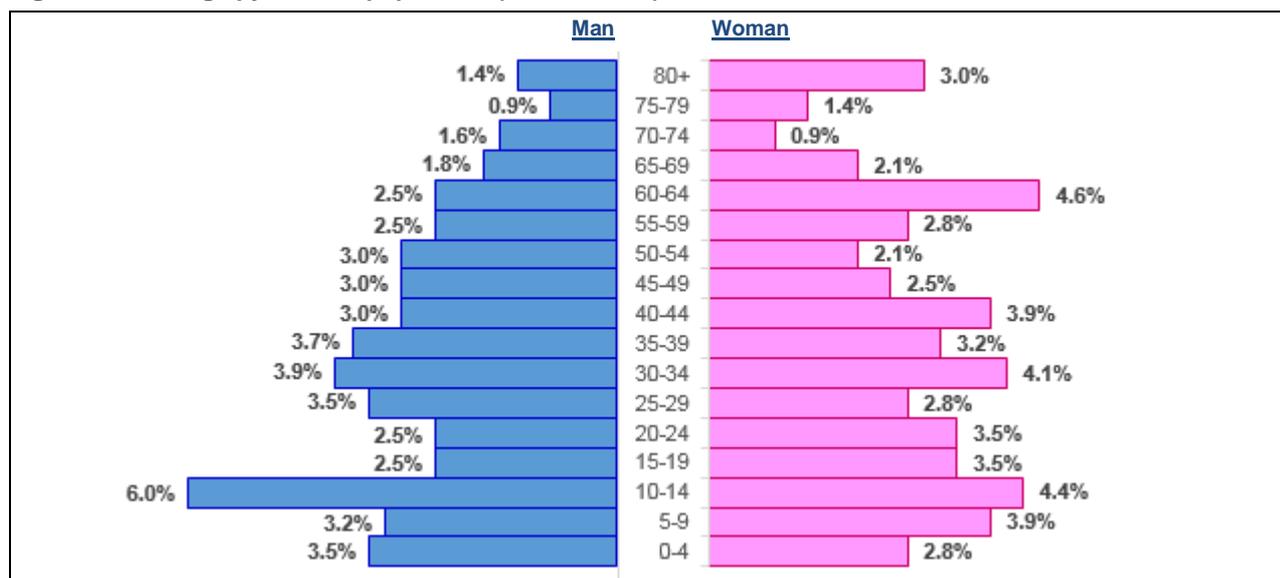


Figure 10 - The age pyramid of population (HH members)



Correlation and combination of age and gender information of the surveyed HHs members results in quite interesting findings. For some age groups there is a slight prevalence of male population upon the female population. This phenomenon is especially notable for the lower age groups. The situation may be partially explained by negative developments of gender control measures applied widely in Armenia in the recent period.

(ID30). Education level (Classification into categories).

As it was already mentioned the total number of 89 surveyed HHs members comprised 434 persons, including 310 adults (71%). Distribution of adult population by education levels is the following (see [Table 85](#)). The only major finding is that share of surveyed population having some professional qualification comprises 31% in total number of adults.

Table 85 - Education level

Education level	Share in the number of HHs' adults
Elementary or no education (0-3 classes)	3%
Main (4-8 classes)	15%
Secondary (9-10 classes)	51%
Vocational	24%
University	7%
Total	100%

(ID31). Marital status (Classification into categories).

As it was already mentioned the total number of 89 surveyed HHs members comprised 434 persons, including 310 adults (71%). Distribution of adult population by marital status is the following (see [Table 86](#)). Overwhelming majority of respondents are married (live in their families).

Table 86 - Marital status

Marital status	Share in the number of HHs' adults
Married	78%
Single	9%
Divorced	1%
Widow(er)	12%
Total	100%

(ID32). Occupation (Classification into categories). As it was already mentioned the total number of 89 surveyed HHs members comprised 434 persons, including 310 adults (71%). Distribution of adult population by occupation is the following (see [Table 87](#)). As the table shows, the share of surveyed HH members with not-employed members prevails (consisting of pensioners, students, disabled persons, etc.). Permanent employment is mainly ensured by local State entities (e.g. municipality, school, etc.). Availability of self-employment opportunities is promising, too.

Table 87 – Occupation

Occupation	Share in the number of HHs' adults
Agriculture	11%
Permanent employment	9%
Temporary (seasonal) employment	8%
Permanent self-employment	2%
Temporary (seasonal) self-employment	8%
Unemployed, looking for job	14%
Student	2%
Pensioner	28%
Disabled	2%
Housekeeper	16%
Other	0%
Total	100%

(ID73). Women groups in target area (Number); (ID74). Youth groups in target area (Number); (ID75). Indigenous people inhabiting in target area (Number). The following table presents the availability of special groups of people in the targeted communities of the DWS sub-component implementation.

Table 88 - Women and youth groups and indigenous people in target area, 2016

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
Aragatsotn						
1. Aragatsavan			1	30	100	400
2. Arteni			1	35	300	100
3. Lusagyugh					0	0
4. Nor Yedesia					16	58
5. Shenavan					0	6
Gegharkunik						
6. Ttujur					0	60
Lori						
7. Chochkan					8	4
8. Dsegh	1	9	1	20	0	0
9. Katnajur					0	70
10. Mets Ayrum					0	6
Shirak						
11. Anipemza					2	0
12. Arevik					10	0
13. Isahakyan			1	17	27	3
14. Jrapi			1	12	0	0
15. Norshen (Bagravan)					4	2
16. Shirakavan			1	18	27	0
Tavush						
17. Baghanis			1	15	2	0
18. Bagratashen					25	120
19. Barekamavan					0	0
20. Gandzakar	1	12	1	25	10	50
21. Haghartsin					0	0

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
22. Sevqar					0	0
23. Vazashen					0	0
24. Verin Karmir Aghbyur	1	30			0	40
Vayots Dzor						
25. Gladzor					0	300
26. Rind			1	35		0
Total	3	51	9	207	531	1,219

The following clarifications should be provided to the information presented above:

1. Women Groups are engaged in organization of public and cultural events, organization of camping for schoolchildren, organic berries production, etc.
2. Youth organizations are engaged in cultural life of communities, addressing youth related issues, provision of computer classes, preparation of grant applications, organization and implementation of community cleaning and improvement events, ecotourism, etc.
3. The number of people in national minorities is notable though they live in not all communities. Among those minorities the prevailing are Yezidi (Kurds).

(ID78). Active service providers/donor organizations/ engaged in the communities (Number/scope of works). International and local development organizations are quite active in Armenia. Development initiatives largely target remote, bordering, and poor communities of Armenian regions, including many communities targeted by the RACP, too. Development initiatives are being funded and implemented by not only institutional specialized entities, but also various individuals and businesses. Availability of such initiatives in targeted communities and type of their intervention is presented below.

Table 89 - Development organizations and their programs in targeted communities (DWS sub-component)

Community	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)
Aragatsotn			
1. Aragatsavan	ENPARD Establishment of dry food production cooperative, provision of equipment	CARD Foundation Establishment of Veterinary and Insemination Center	
2. Arteni	USAID Reconstruction of internal network of drinking water supply, installation of water meters		
3. Lusagyugh	GIZ (IEC Project) Forest planting		
4. Nor Yedesia			
5. Shenavan			
Gegharkunik			
6. Ttujur	APIU/CARMAC Pasture watering	Shen Foundation Reconstruction of kindergarten	
Lori			
7. Chochkan			
8. Dsegh	UNICEF Organization of children's clubs		
9. Katnajur			
10. Mets Ayrum	HEIFER Reconstruction of irrigation network	USAID Establishment of cold storage facility	World Vision Support to the school and kindergarten
Shirak			

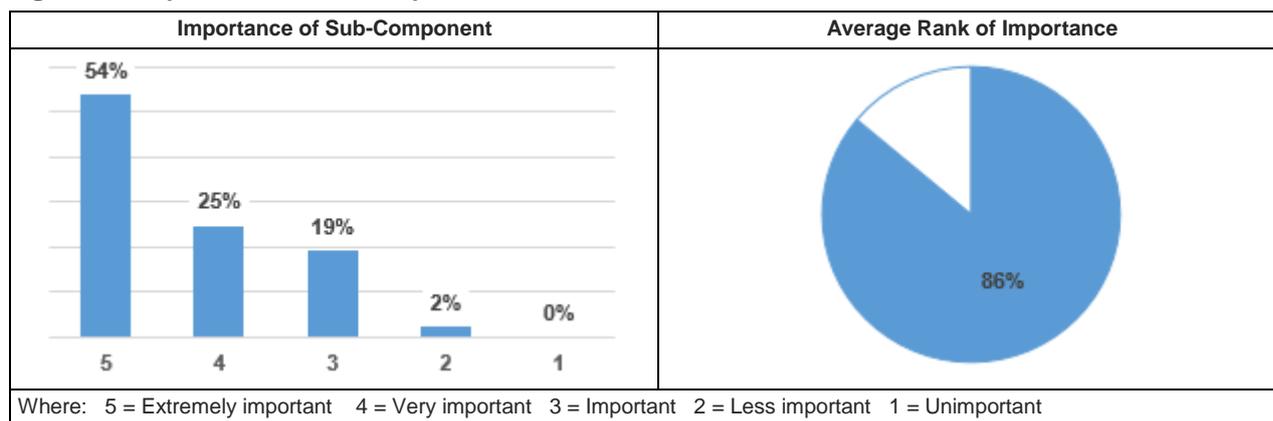
Community	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)
11. Anipemza			
12. Arevik	Caritas Reconstruction of kindergarten		
13. Isahakyan	CDP Construction of sport and play ground		
14. Jrapi			
15. Norshen (Bagravan)			
16. Shirakavan			
Tavush			
17. Baghanis			
18. Bagratashen			
19. Barekamavan			
20. Gandzakar	ECLOF Reconstruction of irrigation network		
21. Haghartsin	ASIF Global project on waste removal, lightening, transportation park		
22. Sevqar			
23. Vazashen	Armenian Dzmer Pap Agricultural consultancy and training		
24. Verin Karmir Aghbyur	ASIF Reconstruction of Municipality and kindergarten	USAID Provision of agricultural machinery and DWS system improvement	
Vayots Dzor			
25. Gladzor			
26. Rind	APIU/CARMAC Pasture watering		
Total			

The table above bases on information collected immediately from the municipalities and Governorates of respective regions, but does not cover all issues related to development initiatives. Some important notes include:

- Many development organizations implement their activities (also for specific communities) from Yerevan or capitals of regions. For example, World Vision is very active in all regions of Armenia through its ADPs, but may not have office or program exactly in a certain village, but target the whole region. The same is with MASCs (agricultural extension services) in regions.
- Many projects have been completed and representatives of communities simply did not mention them. For example, UNDP implemented quite a long-lasting and wide development program in Tavush, APIU covered more than half of Armenian villages, but none of respondents mentioned it.

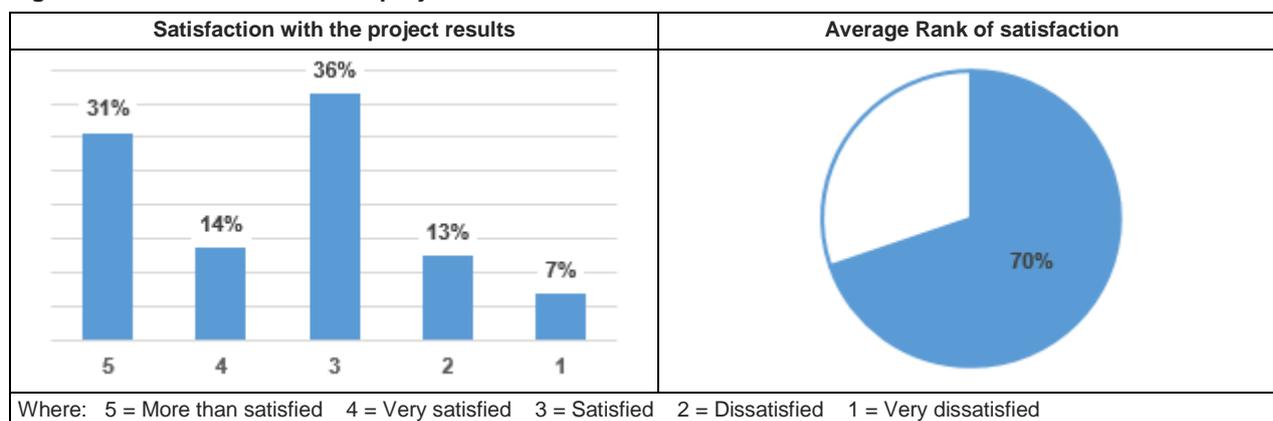
Importance of sub-components. Importance of the DWS sub-component was not included in the list of indicators initially provided in the ToR of the current IA. However, it was added during the discussions in the preparatory stage. Majority of respondents ranked the inclusion of the DWS sub-component in the list of RACP activities as important and extremely important.

Figure 11 - Importance of Sub-Component



Satisfaction with the DWS sub-component implementation results. Assessment of the beneficiaries' overall impression and satisfaction with the results of the development interventions is always a challenging task. The biggest problem is in different interpretation of the attitude and practical impossibility of objective benchmarking. In such situations, the evaluators are left with the only option of relying on subjective feelings and attitude of respondents.

Figure 12 - Satisfaction with the project results



In case of the DWS sub-component implementation the conclusion is rather obvious: the extent of satisfaction among beneficiaries is very high. **The majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.** The IA team did not address the reasons of being dissatisfied since the number of such beneficiaries is really few.

5.2.5 Wrap-Up Conclusion

The following conclusions can be made from the analyses presented above:

- Implementation of the IA was possible only in 2 communities (out of 26) where rehabilitation/reconstruction of the DWS infrastructure has been completed. Thus, the formal rate of the Effectiveness is not high, although it can immediately and drastically change once the DWS systems are completed and handed-over. However, on the basis of completed projects it could be concluded that significant positive dynamics was registered in terms of proportion of the delivered vs. required drinking water, growing share of HHs with secured access to water, and significantly increased service level.
- 90% of beneficiaries of the RACP DWS sub-component registered increase of assets. Similar increase was registered also in income. However, that growth cannot be attributed to the implementation of the sub-component. Instead, other positive implications, such as resolving hygienic issues, use of respective home appliances, etc. took place, which should be directly and completely attributed to the implementation of the DWS sub-component.

4. Notable increase in animal husbandry scale and productivity is observed. This positive change can be attributed to the implementation of the DWS sub-component, though to a less extent and indirectly.
5. Involvement of HHs and their members in collection of water improved drastically (i.e. the time spent for collecting water decreased) and completely due to implementation of the DWS sub-component. This left its positive effect especially on women, who were mainly in charge for the water collection. Among other aspects of the positive impact the alternative labour cost should be mentioned. Beneficiaries saved time that can be used for income generation activities.
6. Increase of the volume of drinking water used by HHs of surveyed communities is significant. That is especially notable in case of the water used for irrigation of homestead lands. In a longer run, this will bring to better productivity and increased agricultural production. All the mentioned changes may be attributed to the implementation of the DWS sub-component almost completely.
7. Positive dynamics is obvious also in case of the number of diseases. Most of them were eliminated completely.

Implementation of the IA was possible only in 2 communities, where the rehabilitation of the DWS infrastructure was completed and handed-over for further exploitation. In this situation it is very hard to provide really applicable recommendations. The only major wish picked from the beneficiaries and forwarded to the RAED PIU and IFAD is the continuation of the interventions. Interventions may continue both vertically (additional investments in the same communities) and horizontally (involvement of new communities in future projects). Good examples of interventions are rehabilitation and (re)construction of drinking water collection ponds and pump stations, reconstruction of in-community supply networks, support for the installation of water-meters, capacity building for community based organizations that became responsible for effective exploitation of the DWS infrastructure, etc.

5.3 REHABILITATION OF PUBLIC UTILITIES: SANITATION AND SOLAR SYSTEMS

5.3.1 Effectiveness

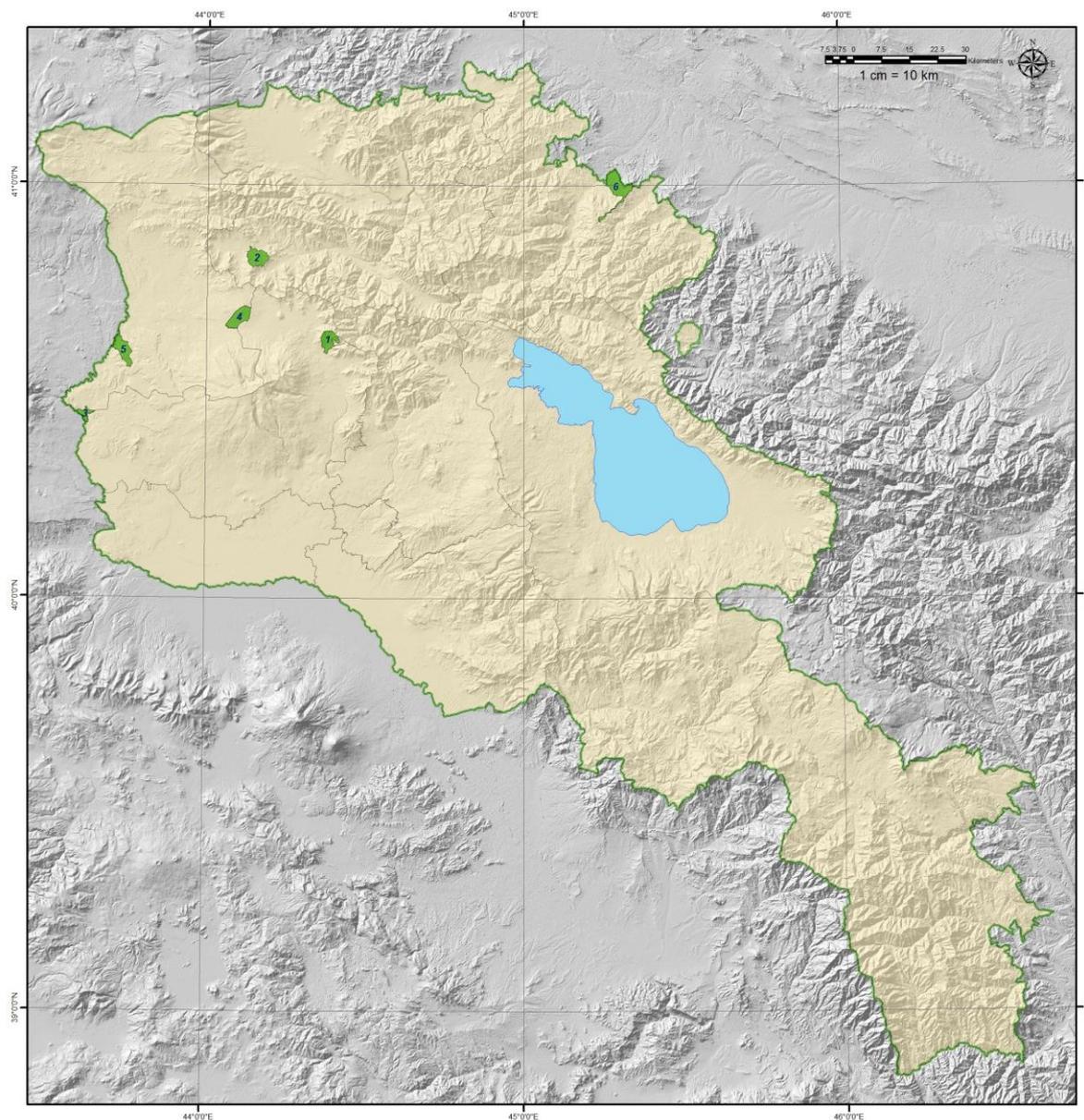
(ID83). Schools/Health centers rehabilitated (pilot sanitation and solar systems). Implementation of Pilot Projects (PP) sub-component was initiated in the context of the last amendment to the IFAD Financing Agreement for the RACP. Two types of projects - sanitation and solar heating panels installation have been initiated within the frames of that sub-component. Results of the sub-component implementation as of the IA implementation moment are the following.

Table 90 – Implementation status of Pilot Projects implementation¹⁷

Region	Community	Pilot Project Description	Number of benefiting people
Aragatsotn	Lusagyugh	1) Installation of solar heating panels in kindergarten	87
Aragatsotn	Lusagyugh	1) (Re)Construction of sewerage system in kindergarten, 2) Construction of outdoor toilet for Municipality, 3) Construction of outdoor toilet for ambulatory.	
Lori	Katnajur	1) Installation of solar heating panels in kindergarten, 2) Installation of solar heating panels in school.	16
Shirak	Anipemza	1) Installation of solar heating panels in ambulatory.	9
Shirak	Norshen	1) (Re)Construction of sewerage system in school, 2) Reconstruction of outdoor toilet for school, 3) Construction of outdoor toilet for ambulatory, 4) Construction of outdoor toilet for Municipality,	211
Shirak	Isahakyan	1) (Re)Construction of sewerage system in school.	191
Tavush	Vazashen	1) Installation of solar heating panels in Municipality.	20
Total number of beneficiaries			534

¹⁷ According to the Mayors of communities

Map 5 - Sanitation / Solar Systems sub-component implementation area



In total, 4 solar heating and 3 wastewater treatment projects have been conducted. Though the number of beneficiaries presented in the table may be considered more, we included only those beneficiaries who will be benefiting immediately and directly, such as children treated in the kindergarten and working personnel only, or permanent employees of the municipalities, only. However, in future this number may/should increase as these are public facilities serving the community members. In addition, the real impact of these activities could be and was assessed based on projections and perceptions to be materialized upon the full operation of the systems. Some more time is needed for full exploitation of all facilities. Respectively, the outcomes presented in the table are of somehow estimated nature. Additional findings on the implementation of the PP sub-component include:

1. The community of Lusagyugh plans to replicate the construction of outdoor toilet for the Events Hall.
2. The community of Katnajur saves 100,000-150,000 AMD per year on water heating due to installation of solar heaters.
3. The ambulatory in Anipemza serves 3 communities, savings will comprise 50,000-100,000 AMD annually.
4. The municipality plans to increase the capacity of the system via installation of more powerful pump. Currently, the estimated savings comprise 50,000-80,000 AMD per year.

5.3.2 Sustainability

(ID63). Likelihood of sustainability of Social Infrastructure (*RIMS Ranking from 1 to 6, to be assessed considering: pilot sanitation and solar systems adequately operated*). As it was already mentioned, construction/installation of the PP infrastructure will be completed as planned. It is recommended to address the issue once again in at least 12 months. However, the sustainability is expected to be strong.

(ID84). Replication of pilot activities (# of sanitation and solar systems). Replication potential of the PPs is too early to measure. However, there are also exact cases of replication. Lusagyugh authorities plan to start a construction of new outdoor toilet for the Events Hall. One case of replication of solar heaters' project happened in Anipemza. A number of people in Vazashen and Anipemza are asking for additional information and technical features of solar heaters. Again, it would be wiser to address the issue after a certain period, e.g. in 12 months.

5.3.3 Wrap-Up Conclusion

Effectiveness and Likelihood of Sustainability of implementation of pilot projects is assessed to be quite high. Despite most of them are not formally finished, most of them actually are. There is a good potential for replicability, examples of similar investments already happened. Some shortcomings are observable in case of sanitation projects, where environmental sustainability is not fully ensured, but that is rather a problem of higher level; those communities do not have central sewerage system operating around. In all other aspects the results of the implementation of the PP sub-component can be considered as satisfactory.

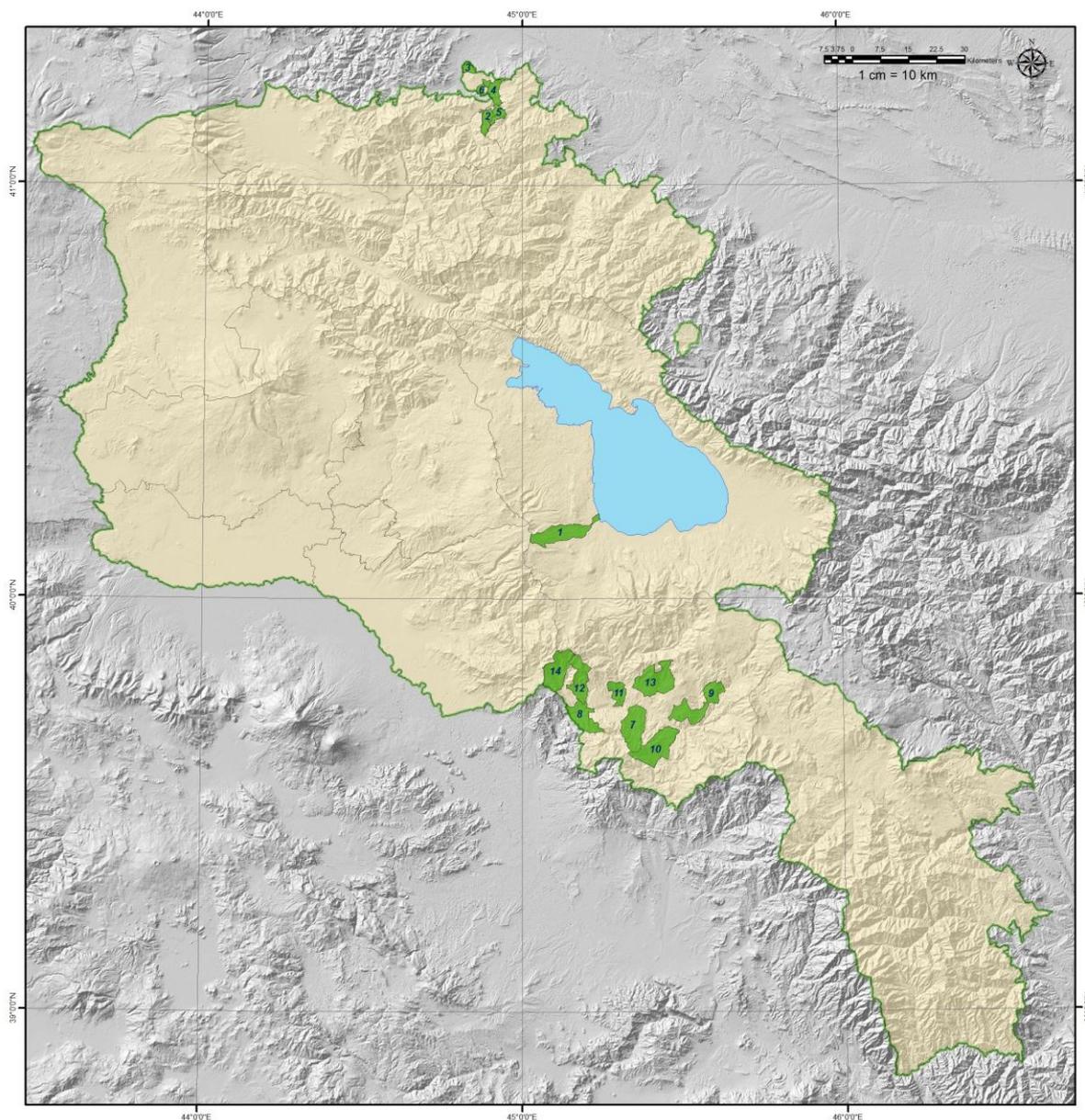
5.4 REHABILITATION OF VALUE CHAIN INFRASTRUCTURE: IRRIGATION WATER SUPPLY

The following chapters will address various aspects of the RACP Irrigation Water Supply (IWS) sub-component implementation. Different issues in this regard have been suggested by the current assignment ToR, the IFAD's RIMS, and the IFAD's Supervision Mission Report in 2015. The mentioned issues have been introduced in the form of indicators that IA implementation team classified into the major groups respective to the pillars of Effectiveness, Impact, Sustainability, and General issues.

5.4.1 Effectiveness

(ID22). Rural Communities benefitting from the irrigation schemes constructed/ rehabilitated (RIMS 1st level) (Number); (ID23). HH benefitting from the irrigation schemes constructed/ rehabilitated (RIMS 1st level) (Number); (ID40). Land under irrigation schemes constructed or rehabilitated (Hectares of farmland and HH plots). Results of the implementation of the IWS sub-component have been defined to be the following: number of rural communities where the sub-component became operational, number of HHs (and their members) benefiting, the area of land under the irrigation. In total, the intervention has been implemented in 14 selected communities.

Map 6 - IWS sub-component implementation area



The results of the IWS sub-component implementation are presented below.

Table 91 - Communities and HHs benefitting from the irrigation schemes constructed/rehabilitated. Land under irrigation schemes constructed/rehabilitated

(ID22)	(ID23)		(ID40)				% of design
			Land under irrigation schemes (ha)				
Community	HHs benefitting from the irrigation schemes constructed/rehabilitated	People benefitting from the irrigation schemes constructed/rehabilitated	Design (target)	Constructed / rehabilitated and handed-over	Constructed / rehabilitated but not handed-over	Not constructed / rehabilitated	
Gegharkunik							
1. Dzoragyugh	1,630	4,464	360	360	0	0	100%
Tavush							
2. Archis	66	191	27	0	27	0	0%
3. Debedavan	161	364	80	0	80	0	0%
4. Haghtanak	130	422	75	0	75	0	0%

(ID22)	(ID23)		(ID40)				
			Land under irrigation schemes (ha)				% of design
Community	HHS benefitting from the irrigation schemes constructed/rehabilitated	People benefitting from the irrigation schemes constructed/rehabilitated	Design (target)	Constructed / rehabilitated and handed-over	Constructed / rehabilitated but not handed-over	Not constructed / rehabilitated	
5. Ltchkadzor	72	276	67	0	67	0	0%
6. Ptghavan	126	339	87	0	87	0	0%
Vayots Dzor							
7. Agarakadzor	200	1,030	60	60	0	0	100%
8. Areni	130	469	45	0	45	0	0%
9. Arin	65	216	100	0	100	0	0%
10. Azatek	180	596	150	0	150	0	0%
11. Getap	185	570	80	0	80	0	0%
12. Rind	350	1,316	130	130	0	0	100%
13. Vernashen	48	114	21	0	21	0	0%
14. Yelpin	260	928	120	0	120	0	0%
Total	3,603	11,295	1,402	550	852	0	39%

The irrigation systems are already operational and a number of households are already benefitting from them since the very first moment of handing the infrastructure over. Hence, the number of beneficiaries is indicated for all communities.

Similarly, currently only 3 communities can be formally assumed as having completed results of the IWS sub-component. This means that value of respective indicator (ID22) currently equals to 21%, but will become 100% with the corresponding government decision in place. All households in the area can benefit from newly reconstructed networks should they choose to become WUA members.

Formally, the **value of the indicator of land under irrigation schemes (ID40) equals 39%**, as only in three communities (Dzoragyugh in Gegharkunik Marz, Rind and Agarakadzor in Vayots Dzor Marz) irrigation networks have been reconstructed and handed over to the communities through GoA decision (425-A, 28.04.2016). However, according to the interviewees, in other 11 communities the reconstruction works have also been completed, but the networks have not yet been handed over to communities. Formally, beneficiaries cannot exploit the network fully legally, yet. Hence, once the corresponding government decision is there, the indicator value would become 100%.

(ID21). Farmland (arable land) under irrigation schemes constructed/rehabilitated (Ha). The ToR of the IA implementation required separation of farmlands from the major indicator of lands that became irrigated after the implementation of the IWS sub-component. The major purpose for this is identification of new opportunities for intensive land cultivation ensured by the intervention. Results are presented in the same way as in case of all lands.

Table 92 - Farmland (arable land) under irrigation schemes constructed/rehabilitated

Community	Farmland under irrigation schemes (Ha)				% of design
	Design (target)	Constructed / rehabilitated and handed-over	Constructed / rehabilitated but not handed-over	Not constructed / rehabilitated	
Gegharkunik					
1. Dzoragyugh	0	0	0	0	100%
Tavush					
2. Archis	27	0	27	0	0%
3. Debedavan	80	0	80	0	0%
4. Haghtanak	17	0	17	0	0%

Community	Farmland under irrigation schemes (Ha)				% of design
	Design (target)	Constructed / rehabilitated and handed-over	Constructed / rehabilitated but not handed-over	Not constructed / rehabilitated	
5. Ltchkadzor	47	0	47	0	0%
6. Ptghavan	87	0	87	0	0%
Vayots Dzor					
7. Agarakadzor	5	5	0	0	100%
8. Areni	35	0	35	0	0%
9. Arin	100	0	100	0	0%
10. Azatek	150	0	150	0	0%
11. Getap	80	0	80	0	0%
12. Rind	56	56	0	0	100%
13. Vernashen	21	0	21	0	0%
14. Yelpin	115	0	115	0	0%
Total	820	61	759	0	7%

The statement for the previous indicator (ID40) holds true for the current one as well. The indicator value is **7%** now, but will become **100%** once the government decision is adopted and constructed/rehabilitated infrastructure is handed over to WUAs/communities.

(ID41). Total land area/Agricultural lands by type/ Average land owned, leased, and contracted (Ha).

It is legitimately planned that implementation of the IWS sub-component should result in certain changes in types and statuses of the land rehabilitated/irrigated. In other equal conditions, land plots under the perennial plots (particularly fruits and other high value crops) should increase at the expense of other lands. Similarly, the use of lands should get intensified, i.e. areas of own and leased lands should grow and there are sufficient bases for stating that notable shift will appear towards high value crops. the situation cannot be assessed as of today because the irrigation water has just recently been provided to the beneficiaries.

Table 93 - Land structure, ownership, and use after (2016) and before (2010) RACP implementation

Land	Land area (Ha)											
	Dzoragyugh			Rind			Agarakadzor			Total		
	2016	2010	Change	2016	2010	Change	2016	2010	Change	2016	2010	Change
Total land under irrigation schemes constructed/rehabilitated	360	360		130	130		60	60		550	550	
Arable land	282	282	0%	5	5	0%	5	5	0%	292	292	0%
Perennial plots	66	66	0%	119	119	0%	24	24	0%	209	209	0%
Orchards	21	21	0%	64	64	0%	20	20	0%	105	105	0%
Vineyards	0	0	0%	55	55	0%	4	4	0%	59	59	0%
Other perennial	45	45	0%	0	0	0%	0	0	0%	45	45	0%
Meadows	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Pastures	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Other	12	12	0%	6	6	0%	31	31	0%	49	49	0%
Average land owned	0.22	0.23	-1.9%	0.22	0.22**	0%	0.30	0.30	0%	0.25	0.26	-1.4%
Average land leased	0.00	0.00	0%	0.00	0.00	0%	0.00	0.00	0%	0	0	0%
Average land under other contracts	0.00*	0.00*	0%	0.00	0.00	0%	0.00*	0.00*	0%	n/a	n/a	n/a

* - Other forms of cooperation mentioned were:

Neighbors cultivate lands of absent households and in return pay the corresponding land taxes (mentioned for Rind);

People cultivate lands belonging to others and in return give them a pre-agreed amount from the harvested crop (mentioned for Agarakadzor). However, the land cultivated under such agreements is very little. Hence, it is not feasible to calculate the average land area under those contracts.

** - In Rind, 51 ha out of total 130 ha belong to two large land owners. Average size of a land plot is calculated excluding these land owners.

There were no planned or actual changes in the areas of agricultural land types in any of the communities with completed irrigation projects. It is too early to talk about large-scale changes, yet. There is a slight difference between the 2010 and 2016 values for the average land owned which happened due to added households in the same area (new families formed and separated from parents).

(ID42). Irrigable land/land irrigated (actual) Land irrigated/full (Ha). Implementation of the IWS sub-component might have two types of possible effect: increase of the actually irrigated area and increase in intensity of irrigation. The change registered in 3 communities with completed irrigation projects is presented below.

Table 94 - Change in irrigable and irrigated land area

Community	Total irrigable land in the community (ha)	Fully irrigated land under schemes constructed / rehabilitated (ha)		
		2016	2010	Change
Dzoragyugh	500	360	240	50%
Rind	164	130	91	43%
Agarakadzor	150	40	40	0%
Total	814	530	371	43%

As a result of the project implementation most of the land under the irrigation schemes constructed has become fully irrigable. In addition, both indicators will register positive change over few several months and seasons.

(ID61). Effectiveness of productive water infrastructure (RIMS Ranking from 1 to 6, to be assessed considering: % of delivered vs. required irrigation water; # of farmers with secure access to water; Incremental hectares of crop grown; hectares with new crops; hectares with high value crops). According to IFAD RIMS guide, this indicator should be calculated taking into account the target values for first level indicators used. However, target values had not been set for most of the indicators. Similarly, interim values for different years between 2010 and 2016 (required by RIMS) are not available either. The heads of WUAs were not able to provide precise information. Finally, some of the first-level indicators supposed to feed into this indicator are actually of little use. Particularly, no plans of increasing land under crops cultivated, land under high value crops cultivated or introducing new crops had been set for the areas under the reconstructed schemes. Thus, the further analyses were based on expert estimations provided by local stakeholders.

Table 95 - Effectiveness of productive water infrastructure

Community	Baseline	Target	Actual	Comments
% of required water delivered	47%	100%	83%	1. The % of required water delivered has increased from 47% to 83%. 2. Number of households with secure access to water has tripled. 3. Capacity of the irrigation systems has significantly increased. 4. Losses in the irrigation systems have decreased to 10%.
Number of households with secure access to water	380	2,180	2,180	
Land under crops cultivated (ha)	550	550	550	
Land under new crops cultivated (ha)		0	0	
Land under high value crops cultivated (ha)	172	172	172	
Losses within the networks (%)	60%	0%	10%	

Assessment of the indicator should be ended with the same reservation: actual figures are far not the last ones, since the infrastructure has just been handed over and is not being used at the full intensity. Figures under the column "Actual" are going to change and substantially. Legitimately, the change will be on the positive side. The indicator was scored 4 (not 5) due to not full completeness of some part of irrigation networks in targeted areas.

(ID79). Improved agricultural and livestock production (a) number of farmers reporting production/yield increase; b) number of farmers adopting recommended technologies). Implementation of the IWS sub-component was aimed to the improved agricultural and livestock production. In the recent period the figures of that production grew, but that growth cannot be fully attributed to the implementation of the IWS sub-component, since completion of the rehabilitation works has just happened (few months ago). Dynamics of improvement of the production volumes is presented below.

Table 96 - Improved agricultural and livestock production

	Crop production		Livestock production			
			Milk		Meat	
	Farmers	%	Farmers	%	Farmers	%
Number of farmers	92	100%	69	100%	44	100%
Number of farmers having increased their production	47	51%	11	16%	21	48%

In the meantime, the IA addressed the issue more precisely investigating also the expectations of the surveyed farmers. It is obvious that production volumes are expected to grow. Impact of the irrigation improvement on the land cultivation results is rather direct and immediate. In addition, availability of irrigation will contribute to the increase of productivity of technical and fodder plants, which will have its consequent positive impact also on the productivity of cattle.

5.4.2 Impact

(ID1). Number of rural people living on less than \$4.30 per day (Percent). It is important to specify that this indicator was calculated on the basis of living expenditures (only livelihood expenses, i.e. investment and business expenditures excluded) reported by beneficiaries. This also includes in-kind consumption of own agricultural produce, i.e. cash and non-cash income of HHs. The following table introduces absolute number of such people and their households, as well as their share in total number of surveyed respondents. Inclusion of the number of households is another recommendation of the IFAD RIMS.

Table 97 - Number of rural people living on less than \$4.30 per day

	Households	People
Total number of surveyed respondents	92	536
Number of people living for less than \$4.3 per day	61	398
Share of people living for less than \$4.3 per day in total	66.3%	74.3%

At first site, the share of extremely poor people (and their households) in total number of surveyed beneficiaries of the IWS sub-component is very high in comparison with not only officially announced figures, but also with estimations of other reliable and authoritative organizations. On the other hand, it should be noted that RACP targeted especially remote and poor communities facing a lot of problems with the poverty on the top of the "Problem Tree".

(ID2). Increase of household asset ownership in communities benefiting from RACP activities (Percent). 92% of beneficiaries of the RACP IWS sub-component registered increase of assets (in type, quantity, or value). In order to conduct the measurement of change, the assets of beneficiaries may be conditionally divided into 2 groups: business (agricultural land, domestic animals, agricultural machinery, etc.) and household (house, passenger car, furniture, etc.) assets.

Table 98 - Increase of household asset ownership

Types of assets	Own the assets	Procured the assets in the recent 5 years	Procurement value, \$ ¹⁸	Average procurement value per 1HH, \$
	A	B (= % in A)	C	D
Land plot	100%	2%	2,447	1,224
Cattle, sheep and goats, pigs	79%	18%	7,538	580
Beehives	3%	33%	98	98
Cowshed	85%	5%	11,258	2,815
Agricultural machinery	10%	44%	734	184
Vehicle	12%	18%	16,642	8,321
Greenhouse	3%	67%	979	490
House	100%	5%	93,000	18,600
Passenger car	66%	46%	196,182	7,007
Furniture	100%	27%	34,361	1,374
TV set	100%	40%	20,191	546
Washing machine	97%	52%	20,627	448
Refrigerator	97%	34%	19,246	642
Water heater	77%	39%	4,895	175
Heating system	45%	29%	9,112	759
Gas stove / oven	98%	17%	5,480	365
Total			442,790	4,813

88% of beneficiaries registered increase of household assets vs. 25% of households that registered increase in business assets. The most frequently procured household assets were washing machines, refrigerators, water heaters, and cars. In case of business assets, the most often met assets were various domestic animals. **Average increase of the value of (all) assets per beneficiary in the period of 2010-2016 comprised \$4,813** (according to the respondents' estimation/valuation (based on actual procurement prices) of their assets).

(ID38). Household Assets Ownership Index of targeted population (*Percentage (to be reported as share of targeted households with improvement in household asset ownership, disaggregated by male and female headed households)*). Some assumptions should be made on definition/identification of man or woman headed HH. In most of HHs decisions are being made mutually, by man and woman ruling the HH. In the meantime, the situation is not always as simple as that. There were situations where final decisions would be made by men, if they were available.

Table 99 - Households with improvement in household asset ownership

	Household Assets Ownership Index		
	Total Assets	Business Assets	Household Assets
Share of HHs that registered any increase of assets in 2010-2016, o.w.	92.4%	25.0%	88.0%
- In male headed HHs	91.5%	19.1%	87.2%
- In female headed HHs	93.3%	31.1%	88.9%

The only major finding related to the increase of assets is that in growth of business assets is more notable in female-headed HHs. This is rather strange, since usually men are more tend to and ready for capital investments than women. In the meantime, there is reasonable explanation. The major part of respondents was picked-up from Dzoragyugh community, where the work migration scale is very high. Men of almost all HHs in this community are being present just for a couple of months, and all decisions related to the HH and also agriculture and business are mainly being made by women.

¹⁸ Respondents mentioned prices in AMD. For converting into USD the IA implementation team applied the exchange rate of \$1=408.6 AMD, which was calculated to be the average value for the period of 2010-2016

(ID3). Increase in income for target households participating in the Programme activities (Percent).

None of surveyed households had comprehensive information on the size of their income. The reasoning of such negative finding is the following:

- There is no practice/culture/habit of keeping records on income among surveyed households. That is why, the figures they tell are usually approximate and incomplete. People tend to forget Irregular (one time) and small income. Bigger than usual (also one-time/irregular) income they prefer not to mention, at all. In both cases the information they provide is being distorted.
- Information about agricultural income is also incomplete and approximated. Part of agricultural produce is being consumed within the households for subsistence purposes. Most of farmers do not equal/identify that consumption as income. Some produce is being sold, including the barter, which is not being evaluated in monetary means, either. Finally, a certain quantity of agricultural products is being processed for further sales or consumption, farmers tend to skip that volume, too.

On contrary, people used to be more cautious while talking about expenses, thus, the provided information is more accurate. In such cases, it is widely accepted to justify the value of income indirectly, via application of the amount of expenses. The basic (rough) assumption is that amount of income plus savings should at least total to the amount of expenses. This method was applied also for the justification of the information provided by respondents; the justified amount was included under the row of “*Other sources*”.

Table 100 - Size and structure of beneficiary households' income

	Income					
	After RACP (2016)		Before RACP (2010)		Change	
	USD	Share	USD	Share	USD	%
Total income of surveyed beneficiary households, including proceeds from:	1,042,806	100%	772,662	100%	270,144	35%
- Agriculture	217,224	21%	223,538	29%	-6,314	-3%
- Work remuneration	114,763	11%	89,492	12%	25,271	28%
- Self-employment	24,645	2%	17,841	2%	6,804	38%
- Rent of assets by others	1,185	0%	1,248	0%	-64	-5%
- Work migration of household member	206,143	20%	188,204	24%	17,939	10%
- Relatives and friends	28,145	3%	19,540	3%	8,605	44%
- Pensions and allowances	97,091	9%	58,150	8%	38,941	67%
- Other sources	353,611	34%	174,650	23%	178,962	102%

Despite the income of beneficiary HHs increased in the recent period, the figures on agriculture actually decreased. However, that decrease cannot and should not be attributed to the implementation of the RACP, since irrigation infrastructure projects have just been completed and handed over, and could not anyhow condition that decrease. Moreover, the IA revealed the subjective nature of that decrease. While answering the questions, the beneficiaries largely based their judgments on their experience and earnings of the last year (i.e. 2015). Climatic situations (severe frost in Rind) and market conjuncture (cease of potato market and drastic drop of prices) conditioned short-term regress in 2 out of 3 surveyed communities, ultimately resulting in cut-off agricultural production and income. Moreover, early spring activities of farmers that joined to the irrigation systems rehabilitated, substantially mitigated the negative impact of external factors and beneficiaries' attitude.

Another very important conclusion should be derived from the above-presented table: the share of income generated via agricultural activities was and remained the biggest in total amount of HHs' income. On the one hand that is legitimate, since the survey was conducted in rural area. On the other hand, not everything is so obvious, since the second share (income generated by work migration is very close to the first one). Interestingly, the biggest increase of income has been registered in amounts of pensions/allowances and contributions from friends and relatives. These are not so sustainable sources of income, since they may be not too much in absolute value and unsustainable. Instead, opportunities ensured by improvement of irrigation water supply are more promising, depend on self-related decisions of beneficiaries.

In the period of RACP implementation, overall income of **IWS sub-component beneficiaries' households grew for 35%**.

Table 101 - Increase in income

	Income, USD			Increase in income
	After RACP (2016)	Before RACP (2010)	Change	
Total income of surveyed households	1,042,807	772,662	270,144	35%
Average income per household	11,335	8,399	2,936	

In the meantime, not all the surveyed households registered increase in income in the period of 2010-2016. Actual increase is registered only with 77% of surveyed households. It remained unchanged for only 1% of beneficiaries, while in case of remaining 22% there was a decrease of income.

Table 102 - Change in income

	Change in income			
	Increase	No change	Decrease	Total
Share of beneficiaries	77%	1%	22%	100%
Amount of change	322,042	0	-51,898	270,144
Change per household, \$	4,536	0	-2,595	2,936

Figures presented in the table need further analysis and revealing of roots. The major part of decrease in income (for 22% of beneficiaries) took place since 2014. The major reasons were of rather general nature and relate to macro-political and macro-economic factors. First, Armenian economy heavily depends on remittances from Russia ensured by tens of thousands work migrants every year. The economic situation in Russia substantially worsened in the recent period due to political confrontation of the RF and EU. This cut-off the economic activeness in the country, ceased markets, drastically decreased funds allocated for construction (where Armenian migrants are mainly employed). All these directly influenced on the income of Armenian HHs, including also in the communities addressed during the survey. The same factors mentioned above narrowed also the consumption market in Russia, which left another negative impact on exports of agricultural products from Armenia. Remaining in the country the agricultural products started losing their value and prices went down, again negatively influencing on income of rural HHs.

(ID4). Increase in the value of land (\$/ha). Implementation of the RACP IWS sub-component changed the market value of beneficiaries' lands (since no change of cadastral values have been initiated by the State authorities). 53% of beneficiaries reported about a rise of the land value and estimated that increase to be 87% compared with the value of land in 2010. Importantly, this increase of the land value is substantially conditioned by the irrigation infrastructure rehabilitation, which gave an opportunity for more productive and profitable activities.

Table 103 - Increase in the value of land due to RACP reported by beneficiaries (for 57% that reported increase)

Communities	After RACP (2016)			Before RACP (2010)			Change	
	Ha*	\$	\$/ha	Ha	\$	\$/ha	\$/ha	%
Total	12.0	777,540	64,741	12.0	414,820	34,540	30,201	87%

The abovementioned 57% of respondents own 12 ha land in total. The reported total value of land possessed by those respondents comprised \$777,540. Dividing the total value of land on total area assessed gives the average value of 1 ha in surveyed communities – \$64,741.

Based on the information presented above it can be calculated that average increase in the value of lands of all beneficiaries of the RACP IWS sub-component comprised 46%. In the meantime, this average figure contains a lot of nuances. There is a big difference in values of the land in different communities of the sub-component implementation. The value of 1st and 2nd category lands (all lands in the

areas of RACP implementation are of those categories) in Dzoragyugh community of Gegharkunik region varies in the range of \$40,000 - \$150,000 per hectare (averaging on \$96,000 per hectare).

Table 104 - Change in value of land reported by respondents thinking that value of their land grew due to RACP implementation (by communities)

Communities	After RACP (2016)			Before RACP (2010)			Change	
	Ha*	\$	\$/ha	Ha*	\$	\$/ha	\$/ha	%
Agarakadzor	0.8	22,290	27,183	0.8	10,645	12,982	14,201	109%
Rind	4.1	72,250	17,752	4.1	29,175	7,168	10,584	148%
Dzoragyugh	7.1	683,000	95,927	7.1	375,000	52,669	43,258	82%
Total	12.0	777,540	64,741	12.0	414,820	34,540	30,201	87%

* - Presented figures relate to lands of only surveyed beneficiaries (92 farmers). I.e. the size of surveyed farmers' land in Agarakadzor community comprised 0.8 ha and it was estimated to have the value of \$22,290 in 2016

The number of population in Agarakadzor and Rind communities are less - 1,508 and 1,726 persons respectively, and the communities have sufficient land resources (especially in case of Rind). In other words, the available supply of lands in surveyed communities Vayots Dzor prevails the demand, which results in more affordable price of land there. It is noteworthy that change in prices of lands with less value is more obvious.

(ID48). Value of the land by category (\$/ha by category). Surveyed respondents did not provide any estimation of the value of meadows and pastures; nobody was able to provide any reasonable opinion. As for perennial plots and arable lands they provided average values/prices (see [Table 104](#)) and insisted that formal category of land does not much affect the value. Instead, they were able to specify that value of the land varies depending on the availability of irrigation. Irrigated lands' value is higher than for other lands for 1.5-2 times.

This assessment has been conducted among all the possible informants (Mayors, heads of WUAs, advanced farmers, etc.) and none of them could not provide better (e.g. more detailed) estimation. The major reason is absence of a land market (intensive transactions on buying and selling lands). Very few cases of land transactions do not provide objective grounds for judgments on this issue.

Other benefits conditioned by the implementation of the IWS sub-component of the RACP. Implementation of the IWS sub-component primarily targeted the increase of income and assets' value of farmers. In the meantime, addressing the results of the sub-component implementation only on that strategic level is far not sufficient for developing comprehensive opinion and impressions on the whole picture of changes (tangible/material or non-tangible) conditioned by the IWS. *Inter alia*, the following positive changes should be mentioned.

Table 105 - Other positive implications of the RACP implementation

Implications	Share of respondents
Improvement in the access of irrigation water	82%
Decrease in losses of irrigation water	67%
Increase in area cultivated by beneficiaries' households	25%
Improvement in productivity of crops cultivated on lands rehabilitated by the RACP IWS sub-component	54%
Decrease or elimination of the risk of land degradation and erosion	65%
Opportunity for cultivating high-value crops	29%

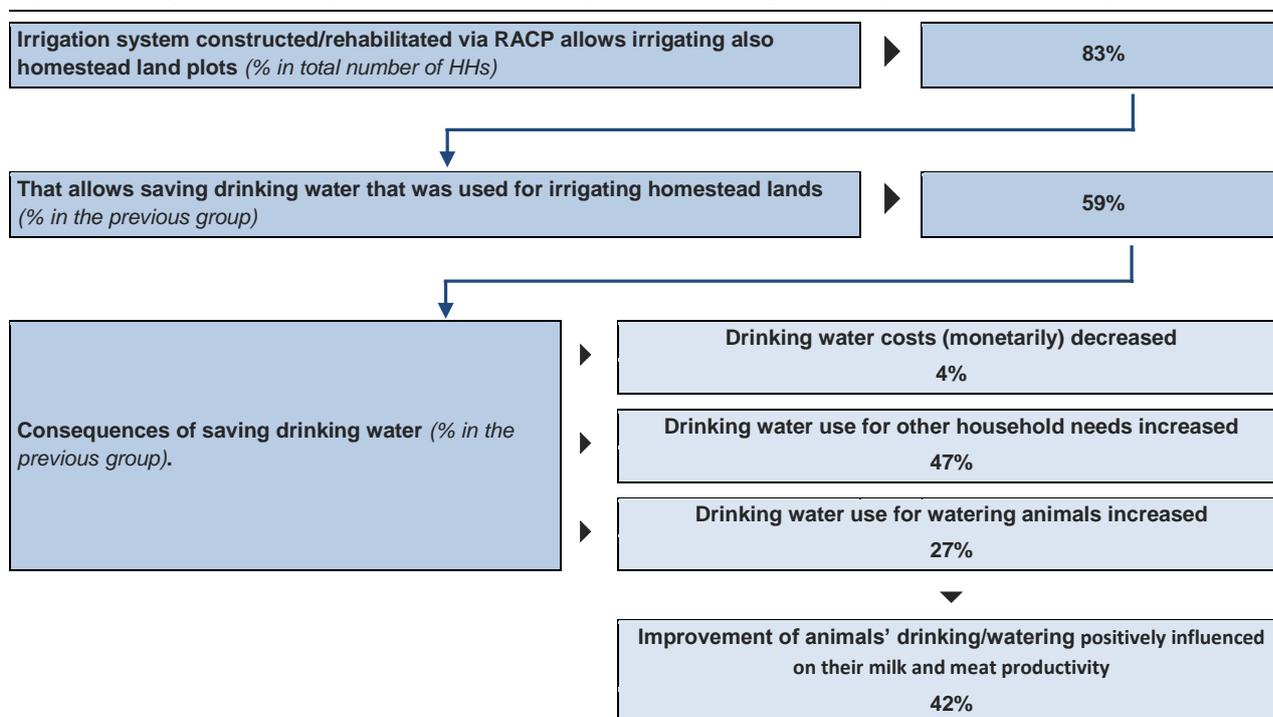
First of all, improvement of the irrigation water supply resulted in improvement of the efficiency of its use. Access to water is among the major issues hindering agricultural development especially in remote and mountainous communities of Armenia. Similarly, the majority of irrigation infrastructure in the country is old/obsolete which causes substantial losses and additional costs, not even talking about lost productivity.

Implementation of the IWS sub-component significantly contributed to the solution of all those issue in target communities.

Aside from quite tangible and immediately measurable effects, implementation of the IWS sub-component resulted also in additional opportunities and improvement of nature conservation issues. The positive environmental impact can be assessed already now, shortly/immediately after completion of the infrastructure rehabilitation. These effects should also be valued, since they appear on rather macro level and condition overall development in a long run. In the meantime, there is a necessity for making one important reservation. All the presented figures are subject to substantial changes; it is too early to make judgments, yet. Rehabilitation of irrigation water supply infrastructure has just happened in the surveyed communities, and the presented figures introduce the situation that was registered immediately after the intervention. The major results need more time to appear and are still to happen.

Impact of the irrigation water availability on the drinking water expenses and respective consequences. Correlation between availability of drinking water and use of drinking water in rural communities is rather immediate and obvious. If nothing else, farmers used to irrigate their homestead land plots by drinking water if they do not have irrigation. Supply of irrigation water cancels the use of more expensive drinking water and ensures other (positive) consequences.

Figure 13 - Impact of the irrigation water availability on the drinking water expenses and consequences



The consequences of the IWS sub-component implementation are very impressive and promising providing that implementation and handing-over happened just recently. The presented positive developments will steadily continue in coming months, when more and more people will start using the irrigation network.

(ID24). Increase of area under orchards in rehabilitated irrigation schemes (Percent). In the very beginning of the RACP implementation it was considered that irrigation projects will complement the FA component, contributing to and ensuring the effectiveness of orchards establishment. Later, in the process of the RACP implementation the approach changed, the sub-component stopped being just a supportive measure, but became a separate sub-component. Justification for making this decision was coming from the very beneficiaries and the GoA that emphasized the importance the role of proper irrigation in ensuring sustainable agricultural activities.

Table 106 - Establishment of orchards in the rehabilitated area

Community	Orchards in the rehabilitated area (ha)		
	After RACP (2016)	Before RACP (2010)	Change
Dzoragyugh	21	21	0%
Rind	64	64	0%
Agarakadzor	20	20	0%
Overall	105	105	0%

There is no change by the moment of the IA implementation, because the irrigation infrastructure has just recently become available. The tangible change will be tracked in coming years.

(ID25). Processors engaged with primary producers in rehabilitated irrigation schemes (Number).

Implementation of the IWS sub-component was planned to contribute to development of value chains for high-value and other crops in the target area. Improved access to market is another very important aspect of the mentioned value chain. In turn, activation of processing organizations that make procurement of crops farmers (can) suggest after the implementation of the RACP intervention is one of the objectives of the project.

Table 107 - Number of organizations (processors) procuring from the targeted communities

Community	Fruit, grapes, and vegetable processors			Milk processors		
	After RACP (2016)	Before RACP (2010)	Change	After RACP (2016)	Before RACP (2010)	Change
Gegharkunik						
1. Dzoragyugh	0	0	-	0	0	-
Tavush						
2. Archis	2	1	100%	1	0	-
3. Debedavan	2	1	100%	0	0	-
4. Haghtanak	0	0	-	0	0	-
5. Ltchkadzor	2	2	0%	0	0	-
6. Ptghavan	4	3	33%	0	0	-
Vayots Dzor						
7. Agarakadzor	1	0	-	1	0	-
8. Areni	4	3	33%	1	0	-
9. Arin	0	0	-	0	0	-
10. Azatek	2	1	100%	2	1	100%
11. Getap	3	0	-	1	1	0%
12. Rind	3	1	200%	0	0	-
13. Vernashen	3	2	50%	1	0	-
14. Yelpin	3	2	50%	1	0	-
Total	15	11	36%	4	2	100%

Table 108 - Processors procuring from target communities

Fruit, grapes, and vegetable processors in 2016	Milk Processors as of 2016
1. Areni Wine Factory CJSC	1. "Golden Goat" Goat Cheese Factory CJSC
2. Armenia Wine Factory LLC	2. "Marianna" Dairy Products Factory LLC
3. Arpa Alco LLC	3. Stepanavan Cheese Factory
4. Berdavan Wine Factory	4. Shant
5. Getap Wine Factory S/P	
6. Getnatoun Wine Factory	
7. Yerevan Champagne Wines Factory OJSC	
8. Hin Areni Wine Factory	
9. Noyemberyan Wine Factory CJSC	
10. "ArtFood" Artashat Cannery	
11. Ayrum Cannery OJSC	
12. Yeghegnadzor Cannery LLC	
13. Artur & Edita LLC	
14. Avshar Prod LLC	
15. Masis Tobacco LLC	

Most of the processors, who are purchasing agricultural products from primary producers in 2016, but were not doing so in 2010 are new entities established during the recent years. In addition, some procurers intensified their operations and started procuring substantially more volume of crops. However, this changes cannot be attributed to the project. In addition to those processors, community members are selling their crop to private intermediaries/resellers, who take the products to local, regional and even export (as for stone fruits) markets.

(ID33). Household Incomes by gender (cash and non-cash) (Including but not limited to income from agriculture, livestock, employment, etc.) (USD/annual average). Traditional specificities of Armenian reality should be taken into account for the segregation of HH income by gender. Some part of HHs' income is being generated **by personal activities of HHs' certain members**. The other part of the HHs' income is being generated via **collective activities of several or all members of HHs**. The survey of the IWS sub-component beneficiaries revealed that 33% of respondents HHs members are engaged in one of income generation occupations. Male members of the surveyed HHs ensure 78% of total income generated; respectively the share of income generated by female members comprises 22%.

Table 109 - Household Incomes by gender

	Total number of HH members	Of which, having own (personal) income		Total amount of income, \$/annual*	Per capita income, \$/annual
		Person	%		
Male	279	117	42%	263,321	2,251
Female	257	60	23%	74,008	1,233
Total	536	177	33%	337,330	1,906

* - Information was collected in AMD. Conversion was made at the average exchange rate for 2016 - \$1=480 AMD, since this is about current income

(ID34). Household expenditures by type (\$/annual average). Size and structure of household expenditures may provide a lot of information about the livelihood standards of surveyed HHs. The higher is their income level, the bigger and more sophisticated is the consumption size and structure. Normally, poorer HHs spend more (proportionally in total income) on everyday needs (food, clothing, utilities), while more secured HHs allocate more funds (again proportionally) for other purposes (entertainment, travel, investments in business, etc.) In the meantime, there are some local specificities that should be necessarily taken into account in the Armenian context. Some of them are the following:

- Armenians relation to education - every Armenian family prefers to cut all expenses, but ensure education of children,
- Demographic situation in remote villages - prevalence of elder people that causes healthcare expenditures and such costs are absolutely non-elastic,
- "Innovations" - in the recent period of 5 years relatively new expenditure rows appeared in the budgets of local HHs, such as gas (due to new installation of pipelines), internet, insurance of cars/vehicles, traffic rules violation fees, etc.
- Demand for sophisticated items of consumption (such as travel, leisure in abroad, expensive household items, regular participation in cultural events, etc.) is traditionally low.

Table 110 - Household expenditures by type

Expenditures	Expenditures, \$				Change	
	After RACP (2016)		Before RACP (2010)		\$	%
	Total	Per 1HH	Total	Per 1HH		
Total	888,521	9,658	620,697	6,747	2,911	43%
▪ Livelihood expenses	792,463	8,614	542,745	5,899	2,714	46%
- Food	167,225	1,818	140,039	1,522	295	19%
- Clothing and shoe	65,174	708	53,304	579	129	22%
- Electricity	28,194	306	27,422	298	8	3%
- Gas	45,737	497	36,613	398	99	25%

Expenditures	Expenditures, \$				Change	
	After RACP (2016)		Before RACP (2010)		\$	%
	Total	Per 1HH	Total	Per 1HH	Per 1HH	
- Fuel-wood	36,831	400	28,705	312	88	28%
- Drinking water	570	6	391	4	2	46%
- Phone and internet	23,630	257	13,376	145	111	77%
- Public transport	11,233	122	8,678	94	28	29%
- Fuel for own car	33,465	364	20,465	222	141	64%
- Education	24,511	266	11,510	125	141	113%
- Healthcare	85,044	924	39,799	433	492	114%
- Other household expenses	26,013	283	15,340	167	116	70%
- Leisure and entertainment	4,430	48	2,912	32	16	52%
- Travel	17,474	190	10,671	116	74	64%
- House maintenance and repair	47,939	521	50,117	545	-24	-4%
- Car maintenance and repair	16,642	181	9,474	103	78	76%
- Asset tax, insurance, fees	8,973	98	4,444	48	49	102%
- Loan principal and interest	72,637	790	20,631	224	565	252%
- Events	71,209	774	45,034	490	285	58%
- Other	5,531	60	3,818	41	19	45%
▪ Business costs for self-employment	12,555	136	9,251	101	36	36%
▪ Agricultural activities' costs	83,503	908	68,701	747	161	22%
- Land cultivation costs	32,258	351	32,068	349	2	1%
- Animal husbandry costs	51,245	557	36,634	398	159	40%

Increase in the amount of almost all expenditures is obvious. The major reason for this is the inflation - prices of all products and services should have increased and did. Average annual inflation rate in Armenia in the recent period of 5 years varied around 5-7% despite several cases of unexpected and critical jumps (as it happened in December 2014). The second reason is, however, the change in surveyed HHs livelihood.

(ID43). Land under high value cash crops (Ha). Cultivation and production of high value crops is another expected (indirect) outcome of the IWS sub-component. Fruits, grapes, and vegetables (excluding potato) have been defined to be high value crops in the context of current assignment. However, no change has been registered *in the areas with rehabilitated irrigation infrastructure of surveyed communities* and that is legitimate. Projects were completed just recently and more time is needed for this change to appear. As already mentioned above, a number of households in Agarakadzor are waiting for the internal network to increase their orchard areas and cultivate more high value crops, such as fruits, instead of potatoes and wheat.

(ID45). Capacity of the irrigation system (% losses in the head unit, % losses within the network). Change in the capacity of irrigation systems and its sub-features, such as losses is among the most important and directly observable/measurable expected results of the project. It is very good to note that results registered already now (almost immediately after the projects' completion) are impressive (especially in Vayots Dzor communities). Major parts of problems have been actually solved.

Table 111 - Improvements of the capacity and other features of irrigation systems

	Losses in the head unit (%)			Losses within the whole network (%)		
	After RACP (2016)	Before RACP (2010)	Change (decrease of losses)	After RACP (2016)	Before RACP (2010)	Change (decrease of losses)
Range	0%-5%	20%-30%	75%-100%	0%-30%	50%-70%	57%-100%

(ID46). Volume of used irrigation water (m³).

Rehabilitation of existing irrigation infrastructure, among other, aimed at increasing/improving the accessibility of irrigation water for farmers of targeted communities. Improved access means more intensive use of infrastructure, more

volume of water consumed, better irrigation, increased productivity, harvest, and higher income generated. The change in the volume of irrigation water used is presented in [Table 112](#).

Table 112 - Volume of used irrigation water (m³/year)

	After RACP (2016)	Before RACP (2010)*	Change
Total	1,376,000	1,140,000	21%

* Planned figures

One important figure from the table regarding the volume of used water should be explained more thoroughly. In 2010, the WUA serving Dzoragyugh community had to plan 500,000 m³ consumption of irrigation water. After implementation of irrigation rehabilitation project significant decrease of losses was registered/achieved. Now, this WUA plans to spend 13% less water for irrigating lands of the community. Besides, losses were decreased not only in the network reconstructed through RACP but in other networks serving the community and reconstructed in the framework of other projects.

(ID47). Fee for irrigation water (\$). Fee for irrigation water is regulated by the government and is not subject to RACP planning. **It has remained unchanged throughout the period - 11 AMD/m³.** The indicated number is what the end user pays for the water used. However, the actual price at which WUAs purchase the water is much higher. The difference is subsidized by state.

(ID49). Community specific main Crop structure (Type/Ha); (ID50). Gross harvest and yield of community specific main crops (Tone per crop/ha). Before the start of the RACP implementation a reasonable supposition was made that construction/rehabilitation of irrigation systems should notably change the profile of agricultural (especially land cultivation) activities in targeted communities. Legitimately, lands previously used for cultivation of cereals and other crops and ensuring some productivity in waterless (or insufficient watering) conditions should be further used already for higher-value crops' (such as fruits, grapes, some vegetables, and other) cultivation. The expected change did not happen, yet, since establishment of land plots for cultivation of higher value crops is not an immediate process and may continue several years before showing the major results/impact. The situation in the surveyed communities (with completed irrigation systems) is the following.

Table 113 - Community specific main (Top 5) crops¹⁹**a) Area, Ha**

Community		Wheat	Barley	Potato	Cucumber	Apple	Apricot	Peach	Cherry	Almond	Grapes	Alfalfa	Other	Total
Dzoragyugh	After RACP (2016)	450	150	150		3						200	35	988
	Before RACP (2010)	500	150	300		3						200	35	1,188
	Change	-10%	0%	-50%	-	0%	-	-	-	-	-	0%	0%	-17%
Agarakadzor	After RACP (2016)	73			4	10	19	5					36	147
	Before RACP (2010)	53			1	4	19	4					29	110
	Change	38%	-	-	300%	150%	0%	25%	-	-	-	-	24%	34%
Rind	After RACP (2016)						25	53	12	10	65		30	195
	Before RACP (2010)						25	50	12	5	57		30	179
	Change	-	-	-	-	-	0%	6%	0%	100%	14%	-	0%	9%
Total	After RACP (2016)	523	150	150	4	13	44	58	12	10	65	200	101	1,330
	Before RACP (2010)	553	150	300	1	7	44	54	12	5	57	200	94	1,477
	Change	-5%	0%	-50%	300%	86%	0%	7%	0%	100%	14%	0%	7%	-10%

¹⁹ Figures relate to the whole community

b) Gross harvest, tone

Community		Wheat	Barley	Potato	Cucumber	Apple	Apricot	Peach	Cherry	Almond	Grapes	Alfalfa	Other
Dzoragyugh	After RACP (2016)	1,350	300	4,500		9						300	70
	Before RACP (2010)	2,500	300	9,000		9						600	70
	Change	-46%	0%	-50%	-	0%	-	-	-	-	-	-50%	0%
Agarakadzor	After RACP (2016)	204			67	36	247	34					540
	Before RACP (2010)	148			19	16	95	11					435
	Change	38%	-	-	253%	125%	160%	209%	-	-	-	-	24%
Rind	After RACP (2016)						20	200	25	5	400		120
	Before RACP (2010)						500	1,000	175	10	700		240
	Change	-	-	-	-	-	-96%	-80%	-86%	-50%	-43%	-	-50%
Total	After RACP (2016)	523	150	150	4	13	44	58	12	10	65	200	101
	Before RACP (2010)	553	150	300	1	7	44	54	12	5	57	200	94
	Change	-5%	0%	-50%	300%	86%	0%	7%	0%	100%	14%	0%	7%

c) Yield (productivity?), Tone per crop/ha

Community		Wheat	Barley	Potato	Cucumber	Apple	Apricot	Peach	Cherry	Almond	Grapes	Alfalfa	Other
Dzoragyugh	After RACP (2016)	3.0	2.0	30.0		3.0						1.5	2.0
	Before RACP (2010)	5.0	2.0	30.0		3.0						3.0	2.0
	Change	-40%	0%	0%		0%						-50%	0%
Agarakadzor	After RACP (2016)	2.8			16.8	3.6	13.0	6.8					15.0
	Before RACP (2010)	2.8			19.0	4.0	5.0	2.8					15.0
	Change	0%	-	-	-12%	-10%	160%	147%	-	-	-	-	0%
Rind	After RACP (2016)						0.8	3.8	2.1	0.5	6.2		4.0
	Before RACP (2010)						20.0	20.0	14.6	2.0	12.3		8.0
	Change	-	-	-	-	-	-96%	-81%	-86%	-75%	-50%	-	-50%
Total	After RACP (2016)	3.0	2.0	30.0	16.8	3.5	6.1	4.0	2.1	0.5	6.2	1.5	7.2
	Before RACP (2010)	4.8	2.0	30.0	19.0	3.6	13.5	18.7	14.6	2.0	12.3	3.0	7.9
	Change	-38%	0%	0%	-12%	-3%	-55%	-78%	-86%	-75%	-50%	-50%	-9%

Assessment of this indicator was conducted in 3 dimensions: a) area cultivated under the main crops, b) total harvest of those crops, and c) productivity of land plots cultivated for those main crops. In total, some 12 main crops have been identified by the IA implementation team in the targeted communities. This means that territories used for cultivation of other crops are not big and cannot notably influence the total mosaic. Changes in areas of cultivation of the main crops did not yet happen in Dzoragyugh though the territories of cereals and potato cultivation decreased. Changes started in Rind and Agarakadzor, less than 20 ha increase in orchards was registered in both communities, but this is just the start. Instead, substantial growth of the territory of wheat cultivation is observed, too. Interestingly, the change in the total harvest volume is actually identical.

The picture is totally different in case of the average productivity of the main crops: this indicator substantially decreased for their majority. Though that change can be attributed to the rehabilitation of irrigation infrastructure to a quite small extent (and positively), some explanations should be provided.

1. Figures of 2010 are actually being compared with the yields of 2015, when a) the implementation of the IWS projects was not fully completed, and natural cataclysms (early spring frost and summer

draught) took place. Respondents automatically based their estimation of yields on the basis of figures registered in 2015.

2. Newly established orchards (that farmers partially established also hoping for improved irrigation infrastructure) decreased the average productivity, since the same volume of harvest was divided onto larger area. It would be much wiser to calculate this indicator in several years, when the newly established orchards will reach to their full productivity.

The major reason is a very high dependence of the harvest from the natural circumstances. The best example can be presented on the volume of harvest of stone fruits (apricot) in Rind community. In 2010 severe frost spoiled the harvest all over Armenia, but Rind avoided that strike. On contrary, 2015 was more or less good year for Armenia, but Rind lost it all harvest of apricots. Thus, judgments about change in harvest volume or productivity should not base on just one year; either average for several years should be calculated, or the figures of “normal/preferable” year should be taken into account.

Additional findings on the analysis presented above include also the following:

1. The decrease of cultivated areas was attributed to HHs leaving the community (the so-called “closed doors”). Orchards in Dzoragyugh are mostly mixed with almost equal number of trees of each type in each orchard.
2. Yield values for the same crops vary significantly even among neighboring communities. Frosts might have affected one community more than the other, but the difference is also largely due to the qualitative nature of the answers. Respondents consulted with various parties and applied qualitative (sometimes subjective) judgment to come up with the required figures. Hence, the yield and gross harvest values should also be treated with reservation.

(ID59). Gross agricultural output by farms (\$/HH annual average). Implementation of the IWS sub-component is supposed to first of all impact on land cultivation, especially on production (area, volume, productivity, assortment, etc.) of high value crops. This presumption is made based on opportunities that implementation of the IWS sub-component will result-in, i.e. improvement of irrigation water accessibility, expanded irrigable area, affordable water, etc. In the meantime, the reality is somewhat different, but that difference has its explanation.

Table 114 - Production output by type (Gross agricultural output)

	After RACP (2016)				Before RACP (2010)				Change	
	Number of producers, HH	Produce, kg	Production volume, \$	Production volume per 1 producer, \$/HH	Number of producers, HH	Produce, kg	Production volume, \$	Production volume per 1 producer, \$/HH	Number of producers, HH	Production volume per 1 producer, \$/HH
Total	92	-	217,224	2,361	92	-	223,538	2,430	0%	-3%
▪ Land cultivation products	92	385,895	137,378	1,493	92	443,319	145,263	1,579	0%	-5%
- Wheat	35	28,275	10,886	311	30	47,570	12,744	425	17%	-27%
- Other cereals	32	11,775	3,960	124	23	10,900	2,396	104	39%	19%
- Legumes	73	2,058	2,685	37	64	4,362	4,418	69	14%	-47%
- Technical crops	0	0	0	-	0	0	0	-	-	-
- Potato	80	90,650	26,345	329	78	106,780	31,352	402	3%	-18%
- Cabbage	64	11,215	2,183	34	63	12,755	2,576	41	2%	-17%
- Cucumber	65	3,183	1,449	22	46	1,922	663	14	41%	55%
- Tomato	59	4,251	1,423	24	50	3,495	945	19	18%	28%
- Eggplant	16	588	150	9	15	530	139	9	7%	1%
- Pepper	63	3,671	1,643	26	51	3,158	1,345	26	24%	-1%
- Carrot	50	1,482	738	15	46	1,440	732	16	9%	-7%
- Onion	38	8,512	3,932	103	27	10,250	4,547	168	41%	-39%
- Garlic	57	1,478	2,816	49	47	1,721	3,360	71	21%	-31%

	After RACP (2016)				Before RACP (2010)				Change	
	Number of producers, HH	Produce, kg	Production volume, \$	Production volume per 1 producer, \$/HH	Number of producers, HH	Produce, kg	Production volume, \$	Production volume per 1 producer, \$/HH	Number of producers, HH	Production volume per 1 producer, \$/HH
- Watermelon	3	200	43	14	3	270	42	14	0%	3%
- Melon	3	250	75	25	3	200	45	15	0%	65%
- Apple	80	28,110	13,576	170	65	28,190	13,409	206	23%	-18%
- Pear	64	13,400	9,717	152	52	10,995	7,777	150	23%	2%
- Apricot	32	3,535	1,346	42	18	3,640	966	54	78%	-22%
- Peach	14	10,180	4,433	317	11	19,586	7,413	674	27%	-53%
- Sweet cherry	63	6,121	5,680	90	37	5,445	5,314	144	70%	-37%
- Cherry	60	3,289	1,951	33	40	3,065	1,794	45	50%	-28%
- Plum/prunes	43	2,032	761	18	34	1,870	690	20	26%	-13%
- Nuts	52	2,461	6,008	116	34	2,151	5,186	153	53%	-24%
- Persimmon	2	20	12	6	0	0	0	-	-	-
- Fig	6	170	184	31	4	160	149	37	50%	-18%
- Berries	33	884	761	23	20	744	523	26	65%	-12%
- Grapes	20	23,545	11,877	594	19	24,250	12,457	656	5%	-9%
- Forage grass	59	123,440	22,564	382	64	136,490	24,060	376	-8%	2%
- Other	2	1,120	181	90	2	1,380	220	110	0%	-18%
▪ Animal husbandry products	85	-	79,846	939	82	-	78,275	955	4%	-2%
- Milk (liter)	69	90,520	42,113	610	67	108,250	47,043	702	3%	-13%
- Meat (kg)	44	6,106	30,059	683	37	4,358	20,788	562	19%	22%
- Egg (piece)	79	64,020	7,332	93	75	78,800	8,976	120	5%	-22%
- Honey (kg)	2	50	343	171	4	200	1,468	367	-50%	-53%

The first and most important statement to be done before passing to analysis of the figures presented in the table is that **dynamics addressed above has no connection with the implementation of the RACP. The table rather presents the situation without RACP.** Negative changes have been registered for the most of land cultivation products, although the number of farmers engaged in cultivation grew for almost all crops. Negative dynamics in production volumes is especially obvious for early ripening stone fruits, legumes, and late ripening vegetables. In 2015, 2 natural cataclysms significantly influenced the agricultural production: a) early spring frost of mainly stone fruits, and b) summer draught that spoiled a big portion of cereals, legumes, and vegetable. Thus, the figures presented in the table are not at all representative for even average year (without improved access to irrigation), not talking about preferable year yield (with improved access to irrigation). Next important conclusion – **completion of the irrigation infrastructure rehabilitation will have its obvious positive impact (though may not be able to turn all minuses into pluses). The long term results of the Project will substantially mitigate general negative dynamics, especially in figures of the productivity.**

Finally, it was already mentioned that surveyed beneficiaries somehow downscaled some figures related to their income generation. In particular, this relates to the number of livestock (e.g. cattle, cows, chicken), animal productivity, cash sales volumes, etc. Thus, the IA team strongly recommends to approach the decreased volumes of gross agricultural production with serious reservations. It was impossible to justify the presented figures (none of additionally addressed experts dared), but the figures related to the change in volumes of milk and eggs production are definitely positive.

(ID52). Production expenses by type (USD/annual average). The following table reveals production expenses of land cultivation activities of surveyed beneficiaries of the IWS sub-component. The presented data refers to total amount of expenses of 92 surveyed beneficiaries. Understandably, nature, structure, and

size of expenses is different for different farmers and depend on the type and scale of their agricultural activities. For example, only 24 out of 92 surveyed beneficiaries use hired labor, only 3 have greenhouses and make respective expenses, only 6 farmers lease land and pay leasing fees. However, the following calculation provides the profile of hypothetical/average farmer. Costs of this “average” farmer have been calculated by dividing all costs into 92. That is why; in the following table only the figures of the last row make sense. Moreover, the only useful/applicable figure is the change per 1 “average” HH.

Table 115 - Production expenses by type

Costs	Expenses, USD/annual				
	After RACP (2016)		Before RACP (2010)		Change
	Total, \$	Per 1 HH, \$	Total, \$	Per 1 HH, \$	Total/Per 1HH, \$
Land cultivation costs,	32,258	351	32,068	349	1%
- Young plants, seeds, seedlings	3,140	34	2,034	22	54%
- Fertilizers and chemicals	5,335	58	4,247	46	26%
- Agricultural machinery services	11,614	126	12,829	139	-9%
- Workers' wages	1,302	14	1,297	14	0%
- Fuel	2,095	23	2,354	26	-11%
- Greenhouse expenses	306	3	37	0	733%
- Transportation costs	2,413	26	2,652	29	-9%
- Land tax	3,406	37	3,807	41	-11%
- Lease	127	1	112	1	13%
- Irrigation water expense	2,447	27	2,649	29	-8%
- Asset tax, insurance	73	1	49	1	50%

As the table above attests, overall amount of production expenses on the side of land cultivation almost did not change. Instead, the structure of expenses changed since 2010; some new expenses appeared, others cut-off to some extent. It is generally good to see that the number of farmers using better inputs (plants, seeds, seedlings, fertilizers, and chemicals) grew. On the other hand, the number of farmers buying services of agricultural machinery, spending on fuel decreased, which may indirectly mean that less farmers apply intensive agricultural techniques. Thus, it is too early making conclusions on possible consequences of the IWS implementation in the target communities.

(ID51). Production income by type (cash and non-cash) (USD/annual average). It was already mentioned that beneficiaries are not fully capable and willing to provide their financials, especially when it comes to revealing their income and benefits.

Table 116 - Production income of HHs from land cultivation activities

Land cultivation outputs/expenses	After RACP (2016)		Before RACP (2010)		Change
	Total, \$	Per 1 HH, \$	Total, \$	Per 1 HH, \$	Total/Per 1HH, \$
Land cultivation output	137,378	1,493	145,263	1,579	-5%
Land cultivation expenses (without farmers salary and depreciation of assets)	32,258	351	32,068	349	1%
Production income from land cultivation	105,120	1,142	113,195	1,230	-7%

Table 117 - Production income of HHs from animal husbandry activities

Animal husbandry outputs/expenses	After RACP (2016)		Before RACP (2010)		Change
	Total, \$	Per 1 HH, \$	Total, \$	Per 1 HH, \$	Total/Per 1HH, \$
Animal husbandry output	79,846	939	78,275	955	-2%
Animal husbandry expenses (without farmers salary and depreciation of assets)	51,245	603	36,634	431	40%
Production income from animal husbandry	28,601	336	41,641	524	-36%

Even taking into account the farmers' subjectivism, tendency to exaggerate expenses and downscale outputs/income, the picture received after respective calculations and extrapolation is not at all promising. However, it represents the general situation and recent dynamics in remote rural areas. Implementation of the IWS sub-component may change the situation to some extent, but that change is yet to happen.

(ID53). Production processing by type (volume and value). Assessment of the volumes of primary products' processing is important since it provides ground for judgments on value-added activities. Normally, the bigger is the volume of commercial processing, the higher is the value added, which influences the farmers' income increase. However, before passing to the analysis of the volumes of different products' processing, some reservations should be made:

1. Primary and processed agricultural products are not homogenous and comparisons between different products may not be relevant. In other words, comparing volumes of wheat flour (processed wheat) and wine (processed grape) is good for nothing. This means, there is no reason and meaning in identification of privileged processed products.
2. Some processing is being made still for HHHs' own subsistence consumption and does not yet mean a process of additional value generation. The best examples are again the milk processing into cheese/matsoun or wheat processing into flour (used for internal consumption almost exclusively).

Table 118 - Production processing by type

	After RACP (2016)				Before RACP (2010)				Change	
	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Value per HH, \$/HH
Total	92	-	46,711	508	92	-	49,041	533	0%	-5%
▪ Land cultivation products	87	27,103	11,899	137	78	22,460	10,040	129	12%	6%
- Wheat	14	10,825	3,880	277	13	9,270	3,546	273	8%	2%
- Other cereals	1	500	196	196	1	300	117	117	0%	67%
- Legumes	8	100	90	11	8	95	86	11	0%	5%
- Technical crops	0	0	0	-	0	0	0	-	-	-
- Potato	0	0	0	-	0	0	0	-	-	-
- Cabbage	29	1,875	377	13	27	1,420	272	10	7%	29%
- Cucumber	35	811	321	9	26	546	207	8	35%	15%
- Tomato	24	1,285	390	16	22	1,160	324	15	9%	10%
- Eggplant	5	138	29	6	4	110	23	6	25%	1%
- Pepper	12	485	212	18	11	430	195	18	9%	0%
- Carrot	10	76	36	4	8	115	66	8	25%	-57%
- Onion	2	35	20	10	2	25	14	7	0%	43%
- Garlic	1	2	4	4	0	0	0	-	-	-
- Watermelon	0	0	0	-	0	0	0	-	-	-
- Melon	0	0	0	-	0	0	0	-	-	-
- Apple	29	1,460	984	34	20	1,255	891	45	45%	-24%
- Pear	22	730	534	24	14	410	374	27	57%	-9%
- Apricot	16	1,005	298	19	10	675	179	18	60%	4%
- Peach	9	760	371	41	8	615	299	37	13%	10%
- Sweet cherry	43	986	804	19	19	657	578	30	126%	-38%
- Cherry	39	685	381	10	26	512	291	11	50%	-13%
- Plum/prunes	12	250	97	8	9	150	66	7	33%	10%
- Nuts	7	98	194	28	2	25	58	29	250%	-3%
- Persimmon	0	0	0	-	0	0	0	-	-	-
- Fig	2	40	49	24	1	30	37	37	100%	-33%
- Berries (mulberry, blackberry, raspberry)	17	507	407	24	9	410	308	34	89%	-30%
- Grapes	10	4,450	2,225	222	8	4,250	2,107	263	25%	-16%

	After RACP (2016)				Before RACP (2010)				Change	
	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Volume, kg	Value, \$	Value per HH, \$/HH	Number of processors, HH	Value per HH, \$/HH
▪ Animal husbandry products	62		34,811	561	63		39,001	619	-2%	-9%
- Milk (liter)	62	64,977	30,272	488	63	78,937	35,856	569	-2%	-14%
- Meat (kg)	11	865	4,540	413	10	585	3,145	314	10%	31%

As it can be seen in the table above, notable positive change (of more than 10-15%) in processing volumes is registered for only few crops and products, though the absolute volumes of their production are not very big, anyhow (exceptions are meat, cabbage, other cereals). Instead, decrease in processing volumes is registered for a number of key products, such as milk, cherries, berries, and apple. Substantial regress is observable, which has the following main explanations:

- **Cut-off of the primary production volumes.** That cut-off is presented and explained in the respective chapter of the current document (see [Table 114](#)).
- **Decrease in demand of processed products in the market.** In turn, this factor bases on following sub-factors: a) continuing migration (200,000 migrants formally confirmed by national statistics) in the recent 5 years, and b) continuously deteriorating economic situation in the country (i.e. increase of poverty) since the Global Economic Crisis in 2008-2009. The situation got even worse since the worsening of economic situation in Russia in the last 2-3 years, due to significant dependence of Armenia from remittances and work migration income generated in that country.

However, recent increase in the number of processors already addressed above in this document attests that situation is going to change in close future. Improved irrigation infrastructure will result in increase of physical volume of production through increased area of cultivation (of high value crops) and improved productivity. Improvement of the quality of products and decreased cost (improved price competitiveness) will be next positive outcomes. All these will create very much attractive supply, which will create very good basis for appearing of payable demand.

(ID54). Market access (% of targeted HH with improved access to markets). Composing features of market accessibility are of huge variety and differ by their nature and intensity, by markets and products, types of producers, etc. The following aspects of market accessibility have been addressed within the scope of the current IA.

Table 119 - Change in features defining market accessibility in the period of 2010-2016

Features	Share of HHs
Product assortment expanded	52%
Volume of agricultural produce grew	50%
Number of procurers of agricultural produce increased	36%
Commercialization level of land cultivation products increased	33%
Types of procurers of agricultural produce expanded (i.e. intermediaries, exporters, processors, retailers, etc.)	25%
Geography of the sales of agricultural produce expanded	25%
Agricultural produce sales terms and conditions improved (price, payment terms)	23%
Number of agricultural produce sales points increased (markets, shops, kiosks, etc.)	21%
Commercialization level of animal husbandry products increased	15%
Improved packaging for agricultural produce	7%

General conclusions deriving from the presented features are not of largely positive nature. More or less wide positive change among the surveyed beneficiaries happened only in case of product assortment expansion and production volume growth. As to other features, positive change was registered only with a limited number of beneficiaries. This is legitimate and is in direct correlation with already discussed economic regress observed in Armenia in the recent period. Finally, the mentioned positive changes can be attributed to the

RACP implementation to a very limited extent. The outcomes of the RACP implementation are yet to appear, especially in terms of impact.

Use of land cultivation products / crops. Commercialization is one of the best indicators for the measurement of market accessibility and intensity of sales. Inter alia, it also measures how sophisticated are the sales, how profitable and liquid they are, etc. The following table describes how surveyed beneficiaries of the IWS sub-component commercialize their produce.

Table 120 - Ways of using of land cultivation products (Commercialization formula²⁰)

After RACP (2016)	Land cultivation products / crops	Own consumption	Cash sales	Barter	Loss	Total
	Cereals and legumes	89%	8%	0.6%	2.2%	100%
	Potato	60%	25%	11%	4%	100%
	Vegetable garden crops	63%	18%	13%	5%	100%
	Fruits	31%	36%	14%	18%	100%
	Grape	28%	68%	2%	2%	100%
Before RACP (2010)	Land cultivation products / crops	Own consumption	Cash sales	Barter	Loss	Total
	Cereals and legumes	75%	19%	1.3%	5%	100%
	Potato	55%	30%	11%	3%	100%
	Vegetable garden crops	66%	20%	12%	2%	100%
	Fruits	33%	33%	16%	18%	100%
	Grape	38%	61%	1%	0%	100%
Change	Land cultivation products / crops	Own consumption	Cash sales	Barter	Loss	
	Cereals and legumes	19%	-56%	-56%	-56%	
	Potato	9%	-18%	-3%	35%	
	Vegetable garden crops	-4%	-7%	10%	136%	
	Fruits	-6%	10%	-9%	0%	
	Grape	-25%	11%	19%	-	

The following immediate conclusions can be made:

- **Dynamics presented in the table above cannot be attributed to the implementation of the project. Figures rather reflect the situation without the project, which means that positive results of the project are yet to appear. Sufficient supply of irrigation water will positively affect the agricultural production, including improvement of all aspects - own consumption, sales, and processing.**
- Own consumption comprises quite a large portion of the use of agricultural products. The negative finding is that subsistence consumption for some products increased, which means less specialization, less cash sales, less income, distortion of HH consumption menu, etc. In the meantime, own consumption volumes grew mainly for low-value products (such as cereals, some legumes, and potato), the costs of which also are not high.
- Cash sales decreased for relatively cheap products for the following reasons: decrease of overall production volume, increase of barter, and increase of the spoiled volume. All findings are negative, anyhow.

Procurers and sales channels for land cultivation products. Before passing to actual introduction of changes in proportion of beneficiaries cooperating with different counterparts, it should be noted that analysis

²⁰ The share of processed produce is involved in either own consumption column (if the processed products have been consumed internally), or in the volumes of cash sales (if the processed products were ultimately sold)

relates to only those farmers, who made cash sales. Also, we should be cautious in assessment of changes: big changes in percentages does not yet mean real change in absolute figures.

Table 121 - Share of agricultural produce sold via various sales channels

Procurers / sales channels	After RACP (2016)	Before RACP (2010)	Change
In the market: wholesale or retail	17%	27%	-37%
Intermediaries (from the orchard or storage)	71%	64%	12%
Exporters (from the orchard or storage)	5%	1%	665%
Processors	6%	7%	-8%
In abroad (own exports)	0%	0%	-
Other	0%	1%	-92%
Total	100%	100%	

The only major finding that can be extracted from the analysis of beneficiaries' answers is the following: notable decrease is registered in the portion of agricultural produce that was directly sold in the market. One third of farmers gave-up the efforts for sales and marketing and preferred wholesale sales to intermediaries and exporters. That decrease was compensated by the entry of intermediaries and exporters; more volumes of agricultural products were sold via them in 2016. In the meantime, cooperation with intermediaries and exporters is possible only in case of having really good quality products and being ready for negotiations of better procurement prices for procurers; these factors are expected to appear as results of the project.

Use of animal husbandry products. Commercialization is one of the best indicators for the measurement of market accessibility and intensity of sales. *Inter alia*, it also measures how sophisticated are the sales, how profitable and liquid they are, etc. The following table describes how surveyed beneficiaries of the IWS sub-component commercialize their produce.

Table 122 - Use of animal husbandry products

After RACP (2016)	Animal husbandry products	Own consumption	Cash sales	Barter	Loss	Total
	Milk	85%	11%	4%	0.2%	100%
	Meat	52%	32%	15%	1%	100%
	Egg	99%	0.5%	0.8%	0.1%	100%
Before RACP (2010)	Animal husbandry products	Own consumption	Cash sales	Barter	Loss	Total
	Milk	83%	15%	2.5%	0.1%	100%
	Meat	56%	41%	0%	2%	100%
	Egg	99%	0.4%	0.8%	0.1%	100%
Change	Animal husbandry products	Own consumption	Cash sales	Barter	Loss	
	Milk	3%	-26%	56%	47%	
	Meat	-8%	-22%	-	-71%	
	Egg	0%	9%	9%	3%	

The following immediate conclusions can be made:

- Volume of own consumption of animal husbandry products by surveyed beneficiaries of the IWS sub-component is substantially higher than in case of land cultivation products. The situation stayed almost unchanged since 2010.
- Share of farmers selling milk and meat for cash decreased substantially. The major reason for this is the unfavorable market conjuncture. Milk prices went down significantly, especially in 2015 (from AMD180-200 to AMD 100-120 per kg). Processing factories that are the major procurers of milk prefer using substantially cheaper dried milk imported from abroad. The market of meat also decreased and

mainly due to decreased volumes of consumption and limited access to major markets (such as meat passages in agricultural markets and supermarket chains of Yerevan).

Procurers and sales channels for animal husbandry products. Before passing to actual introduction of changes in proportion of beneficiaries cooperating with different counterparts, it should be noted that analysis relates to only those farmers, who made cash sales. Also, we should be cautious in assessment of changes: big changes in percentages does not yet mean notable change in absolute figures.

Table 123 - Procurers and sales channels for animal husbandry products

Procurers / sales channels	After RACP (2016)	Before RACP (2010)	Change
In the market: wholesale or retail	56%	58%	-3%
Intermediaries (from the orchard or storage)	42%	37%	13%
Exporters (from the orchard or storage)	0%	0%	-
Processors	2%	3%	-41%
In abroad (own exports)	0%	0%	-
Other	0%	1%	-100%
Total	100%	100%	

Proportions of surveyed beneficiaries selling their animal husbandry products did not change substantially. However, as in case of sales of crops, the share of direct sellers in the market decreased, and the share of intermediaries increased. On the one hand this is negative – farmers lose a part of their profits, which goes to the pocket of intermediaries. On the other hand, this partially contributes to the development of cooperatives and solves market accessibility issues. Individual farmers suffer from impossibility of cooperating with large processors (e.g. dairy organizations) much, while those dairy firms are very much interested to work with cooperatives.

(ID91). Effectiveness: Producers benefiting from improved access to markets (Volume/value of marketed produce by beneficiaries; # of farmers signing contract with buyers). This indicator measures the increase of the access to markets for farmers that is the secondary effect of the project activities. It was already mentioned that improved primary production will create high quality and competitive supply, which in turn will find respective demand in the market. Improvement of the market accessibility in 2016 in comparison with 2010 is presented below.

Table 124 - Effectiveness: Producers benefiting from improved access to markets

		Crop production		Livestock production	
		Farmers	%	Farmers	%
1.	Number of farmers	92	100%	85	100%
	Number of farmers reporting increased volumes of marketed produce	20	22%	8	9%
2.	Number of farmers	92	100%	85	100%
	Number of farmers having sales contracts with buyers	33	36%	30	35%

The obvious conclusion from the information presented above is that not a major part of farmers registered improvement of the access to market in the recent period. The major reason is again the same: general economic recession in Armenia. Obviously, implementation of the project will improve the situation in targeted communities notably, but the extent of that change is yet to appear.

(ID55). Availability of agricultural machinery (Percentage of Yes/no, type, quantity). Availability and condition of agricultural machinery and equipment, as well as intensity of their use are good indicators for the assessment of the extent of intensive agriculture implementation. Affordability of the use of agricultural machinery and equipment is among the biggest problems and strategic issues in nowadays rural development concept. Not being able to face/afford costs related to the use of machinery many farmers have to limit their activities with homestead agriculture, which is far not sufficient for ensuring appropriate livelihood.

On the other hand, being able to afford those costs does not yet mean using, neither. Availability of agricultural machinery and modern equipment is not on a high level in Armenia. The majority of available techniques is inherited from soviet period and is fully obsolete. The table below comes to attest that statement the best.

Table 125 - Availability of agricultural machinery and equipment

Types of agricultural machinery and equipment	Own the agricultural machinery (share in total)	Procured the assets in the recent 5 years (share in total)	Number of agricultural machinery per 100 farmers (HHs)
Tractor	4%	0%	4
Seeder	0%	0%	0
Fertilizer spreader	0%	0%	0
Chemical (liquids) spreader	53%	36%	53
Harvester / Combine	0%	0%	0
Mower	8%	7%	8
Grass baler / collector	0%	0%	0
Drip irrigation	1%	1%	1
Cow milking equipment	0%	0%	0

The conclusion is rather obvious - overwhelming majority of farmers cannot afford buying/owning agricultural machinery and equipment. In the meantime, most of them needs to (has to) use that machinery. The table below shows how farmers attract and use it.

Table 126 - Ways of obtaining/using agricultural machinery and equipment

Types of agricultural machinery and equipment	Do not own agricultural machinery and equipment	Ways of obtaining / using agricultural machinery and equipment				
		Hire	Buying service	Use free of charge	Do not need	Total
Tractor	96%	28%	63%	2%	7%	100%
Seeder	100%	22%	30%	1%	47%	100%
Fertilizer spreader	100%	7%	4%	0%	89%	100%
Chemical (liquids) spreader	47%	12%	28%	14%	47%	100%
Harvester / Combine	100%	23%	53%	0%	24%	100%
Mower	92%	25%	39%	1%	35%	100%
Grass baler / collector	100%	23%	42%	1%	34%	100%
Drip irrigation	99%	0%	0%	0%	100%	100%
Cow milking equipment	100%	1%	1%	1%	99%	100%

Again, the presented information is largely self-explanatory. Most of farmers either hires the main machinery (e.g. tractor, harvester, grass mower and collector) and uses it, or buys the services of the owners/mechanics of the machinery. In the meantime, it is surprising to see quite a big share of farmers who think they do not need this or that machinery. It is especially strange in case of such important equipment as fertilizer spreaders, drip irrigation, seeder, etc.

(ID56). Livestock and poultry (Number by type). Animal husbandry activities are available in all rural communities of Armenia, with almost no exceptions. The real difference is in intensity of those activities. There are some regions where animal husbandry is the major and leading sphere of not only agricultural, but overall economic activities. The most important indicator of animal husbandry activities is the availability of various animals.

But, before passing to the results of the survey, there is a need for a major reservation. After compilation of the information collected via the fieldwork, the IA implementation team saw a need for cross-check and justification for the number of livestock for cattle, cows, and chicken. Those figures were far beyond the average figures for the whole village and region. Consultations were conducted with informed experts (mayor,

veterinarian, lead farmer), which resulted in a conclusion that respondents downscaled the number of livestock for about 30-40%. The major explanation is the following: availability of livestock (cattle) may cause the HH to be excluded from the social support programs. That is why, HHs tend to hide the real number of animals they breed. In the surveyed communities the situation is the following.

Table 127 - Livestock and poultry

Types of animals	After RACP (2016)			Before RACP (2010)			Change	
	HHs share in total	Livestock, head	Livestock per 1 HH, head/HH	HHs share in total	Livestock, head	Livestock per 1 HH, head/HH	HHs share in total	Livestock per 1 HH, head/HH
Cattle, of which...	80%	187	2.5	78%	144	2.0	3%	26%
Cows	76%	140	2.0	77%	100	1.4	-1%	42%
Sheep	5%	24	4.8	12%	70	6.4	-55%	-25%
Goat	1%	2	2.0	3%	10	3.3	-67%	-40%
Pig	17%	20	1.3	20%	23	1.3	-11%	-2%
Chicken	90%	1,292	15.6	90%	1,280	15.4	0%	1%
Beehive	3%	13	4.3	4%	33	8.3	-25%	-47%
Horse, donkey	0%	0	-	0%	0	-	-	-
Turkey	0	0	-	2%	18	9.0	-100%	-

Increase of the livestock of cattle (and particularly the cows) is understandable. Demand for milk is always high, although the prices of procurement vary substantially depending on the season, availability of dried milk the market, etc. Formation of cooperatives substantially contributed to the increase of livestock, too. Marketing and sales of other agricultural products became very difficult. Among the major problems surveyed beneficiaries mentioned impossibility of direct sales (at higher prices) of their products to consumers (especially in Yerevan markets). Intermediaries “swallow” the major part of profit, offering quite unattractive procurement prices.

(ID57). Productivity of livestock and poultry by type (volume, annual average). Agricultural animals' productivity figures also decreased substantially since 2010. But significance of that decrease is obvious only in case of presenting the change in shares. Providing generally low figures for productivity, even small change causes big deviation when presented in percentages.

Table 128 - Productivity of livestock and poultry by type

Animals	After RACP (2016)	Before RACP (2010)	Change
Cows' milk productivity, liter/year	1,139	1,174	-3%
2-year fed calf/bull meat productivity, kg/head	140	143	-1%
6-month fed pig meat productivity, kg/head	52	56	-8%
8-month fed sheep meat productivity, kg/head	12	17	-33%
Chicken egg productivity, egg/year	100	104	-4%
Beehive honey productivity, kg/hive	8	9	-9%

Explanation for the identified decrease in the productivity figures is rather simple. In the moment of conducting the survey farmers were not able to provide their estimation of productivity for the year of 2016. As an alternative, they provided figures of 2015, which were very low than average figures due to natural/climatic conditions, i.e. draught. IA implementation team again applied to the experts seeking an estimation of losses, but none of experts could provide such figures. However, providing quite a small absolute decrease in productivity figures in the period of assessment, it is obvious that potential figures for average good year will be notably higher than presented. Inter alia, this statement is backed-up also by the animal breeding measures applied and respective expenses made by surveyed farmers.

(ID58). Expenditures on livestock by type (\$/HH average annual). Types and intensity of expenditures are in direct correlation with the overall productivity features. *Ceteris paribus*, the more farmers spend for animal husbandry purposes the better results they should get, the higher should be the productivity, the more

should be the produce. However, there are some external factors, that may substantially affect and change that rule, as in case of climatic force-majeure. Expenditures made by surveyed farmers for their animal husbandry activities are presented below.

Table 129 - Animal husbandry expenditures by type

Expenditures	After RACP (2016)		Before RACP (2010)		Change
	For all HHs, \$/annual	For 1 HH, \$/annual	For all HHs, \$/annual	For 1 HH, \$/annual	
Animal feeding (bought, of all types)	27,438	323	17,259	203	59%
Animal healing (medicaments and veterinary services)	3,277	39	1,793	21	83%
Shepherd remuneration	4,413	52	4,630	54	-5%
Transportation	2,930	34	2,778	33	5%
Workers remuneration (grass harvest, loading, unloading, shelving)	3,798	45	1,444	17	163%
Agricultural machinery and equipment	9,391	110	8,730	103	8%
Total	51,245	603	36,634	431	40%

Conclusion on the expenditures applied for animal husbandry activities is rather unambiguous: all costs have substantially grown since 2010. Inter alia, the following reasons may be brought for explaining that increase:

- **Awareness increase and change in mentality.** Many farmers did not pay much importance to proper practices of animal breeding. The major animal breeding measure was taking animals to the pasture and feeding them with minimum quality forage, almost not talking about any veterinary services. This situation substantially changed in the recent period; farmers comprehended that they are supposed to face certain expenditures if they are going to continue animal husbandry, at all.
- **Livestock growth.** The livestock grew (although not formally) especially for cattle, which require the most expensive treatment. Farmers started buying more feeding, medicaments, paying more to attracted workforce, etc.
- **Appearing of new services.** Farmers started consuming new services, especially those provided by veterinarians. The best example is the artificial insemination of cows. The price for this service varies in the range of \$10-20, which is already enough for ensuring the major part of registered change.
- **Increase in prices of inputs.** Prices of agricultural inputs grew substantially especially for feeding. The price for one bale of grass (18-20 kg) increased from 800-900 AMD to 1,200-1,400 AMD. Prices for medicaments were continuously growing until 2015. Since then they went down substantially (almost to the same level and even below) as they were in 2010. The reason is Armenia's participation in Eurasian Economic Union; the number of importers increased substantially which caused severe competition and decrease in prices. However, the increased costs for feeding significantly prevail in total amount of expenditures.

(ID71). Number of jobs generated by small and medium enterprises (SMEs) in project targeted areas (Number of new employees, disaggregated by gender). (ID92). Rural Enterprise Development and employment Effectiveness: creation of employment opportunities (Number of new jobs created). Implementation of the IWS sub-component did not result in generation of jobs at SMEs in targeted communities, yet. In the meantime, it is too early for such changes. Operation of only 3 rehabilitated irrigation infrastructure just started, and social level changes could not appear in just 1-2 months. The stakeholders noted that some change in intensity of operations will be observed in processing factories procuring increased volumes of agricultural products of surveyed farmers already this year, but it is too early for the measurement of that change. Similarly, farmers mentioned about the possible increase in hiring of labour in their agricultural activities, but they were not able to estimate the possible volumes.

5.4.3 Sustainability

(ID64). Likelihood of sustainability of productive infrastructure (RIMS Ranking from 1 to 6, to be assessed considering: Number of functioning pipelines, channels and drains; WUA cost recovery; WUA staff

per ha). (ID85). Likelihood of sustainability of the groups managing social infrastructure strengthened (RIMS Ranking from 1 to 6, to be assessed considering: Number of WUAs operational / functional; fee collection rates; membership). Each WUA serves a large number of communities with varying associated costs which cannot be allocated to individual communities. Also, service hectares per WUA staff member for 2010 and 2016 are not useful as no target/optimal values were set for these indicators. Hence the assessment of the indicator has been performed using mainly qualitative judgment based on respondents' opinions.

Table 130 - Likelihood of sustainability of productive infrastructure and WUAs

Community	Baseline	Target	Actual	Comments
The length of functioning pipelines in the area of rehabilitated schemes	4,000	4,784	4,797	1. The irrigation network is reconstructed as planned and serves the water users in the respective area. 2. The average area served by one WUA staff member is within the normal range to operate effectively. 3. Collection rates both for water and membership fees are quite close to 100%. 4. WUA representatives are mostly confident, WUAs have the necessary resources to sustainably serve their communities.
The length of functioning channels and drains in the area of rehabilitated schemes	0	0	0	
Hectares served by one WUA staff member	38.64	N/A*	29.97	
Water tariff collection rate	92%	95%	95%	
Membership fee collection rate	87%	100%	100%	
Hectares served by one WUA staff member	38.64	N/A**	29.97	

* - The optimal area to be served by on WUA staff member is 40-50 ha depending on the plot sizes in the area. As long as the average area served by on WUA staff member does not exceed the indicated size, it is considered to be within the norm.

** - The optimal area to be served by on WUA staff member is 40-50 ha depending on the plot sizes in the area. As long as the average area served by on WUA staff member does not exceed the indicated area, it is considered to be within the norm.

(ID69). Operation and Maintenance (O&M) organizations / groups. Problems with O&M (Type/Number).

Any infrastructure requires O&M measures and expenses over the period of exploitation. Properly organized O&M guarantees the sustainability of the infrastructure work and long lasting exploitation. O&M issues may conditionally be divided into the following two major aspects: a) availability of O&M service providers and b) affordability of O&M costs. These O&M issues in surveyed communities with completed irrigation system projects is the following.

Table 131 - Beneficiaries' awareness on irrigation system O&M

Questions	Beneficiaries' responses			
	Yes	No	Do not know	Total
Do you have an Operation and Maintenance (O&M) organization servicing your irrigation system?	89%	8%	3%	100%
	↓			
Do you know the name of the O&M organization?	90%	10%	-	100%
	↓			
Please provide the name of the O&M organization:				
- WUA	38%			
- Know only the name of the O&M organization representative	61%			
- Municipality	1%			

Overwhelming majority of surveyed beneficiaries are aware of the availability of the provision of O&M services, i.e. they know that there is such organization that provides (or should provide) O&M services. Interestingly, for the majority of beneficiaries the O&M service providers are identified with specific persons, not an organization (which is more legitimate when talking about large infrastructure). However, it is understandable that in small rural communities' consumers do not name the organization, but a person delivering services on behalf of that organization.

5.4.4 Other Issues

(ID26). People/HHs in target area (Number). Total number of HHs in the targeted 14 communities of the IWS sub-component implementation comprises 6,293, and the number of population is 19,525 persons. Distribution of those figures by communities is presented below.

Table 132 - People/HHs in target area

Community	HH ¹⁾	Popula-tion ²⁾	Community	HH ¹⁾	Popula-tion ²⁾	Community	HH ¹⁾	Popula-tion ²⁾
Gegharkunik			Tavush			Vayots Dzor		
1. Dzoragyugh	1,630	4,464	2. Archis	387	1,122	7. Agarakadzor	258	1,328
			3. Debedavan	267	605	8. Areni	545	1,966
			4. Haghtanak	395	1,283	9. Arin	103	343
			5. Ltchkadzor	108	414	10. Azatek	171	566
			6. Ptghavan	308	829	11. Getap	785	2,420
						12. Rind	402	1,510
						13. Vernashen	551	1,307
						14. Yelpin	383	1,368

¹⁾ Source: 4-year development plans of respective Governorates and communities

²⁾ Source: "Marzes and Yerevan city of the Republic of Armenia in figures, 2015", NSS 2015 (number of de-jure population of January 1, 2015)

(ID27). Average HH size (Number). Size of HHs in the target area is a very important indicator that not only describes the social status and composition of beneficiaries' families, but is also being used in calculation of many other important indicators, such as per capita income and expenditures. Good ground for comparisons may serve the average figures for HH members in Armenia that varies around the coefficient of 4 persons per HH.

Table 133 - Average HH size

Number of HH members	HHs		Total number of HH members, persons	Average number of HH members, person/HH
	Number	Share		
1 person	0	0%	0	
2 persons	7	8%	14	
3 persons	5	5%	15	
4 persons	14	15%	56	↓
5 persons	21	23%	105	
6 persons	18	20%	108	↓
7 persons	11	12%	77	
8 persons	6	7%	48	
9 persons	1	1%	9	
10 persons	2	2%	20	↓
11 persons	2	2%	22	
12 persons	3	3%	36	
13 persons	2	2%	26	
Total	92	100%	536	5.83

The average number of HH members in surveyed communities significantly exceeds the average¹⁾ figure for Armenia. This phenomenon has the following explanations:

- Traditionally, the HHs in rural areas of Armenia are bigger than in urban places. People used to have more children in villages than in cities.
- Traditionally, several families in rural communities used to live within the same HH (i.e. under the same roof, sharing food and budget). Those families usually are the aged parents, 1 or 2 sons with their wives and children. Thus, HHs with reported figure of more than 6-7 persons does consist of such several generation families. Moreover, in order to ensure this communal behavioral phenomenon, the

head of family usually aims at construction of a bigger house. This behavior started changing already, but most likely it will sustain for another generation in rural communities, yet.

(ID28). Age (Classification into categories); (ID29). Gender (Male/female). Information on age distribution of surveyed HHs members is largely self-explanatory. Just one important conclusion can be derived: more than half of the surveyed HHs members are in the workable age of 20-60 years old. This means that there is no (and is not expected) lack of productive workforce to exploit the constructed/rehabilitated infrastructure.

Table 134 - Age

HH members age groups	Total number of HH members	
	Person	Share
0-4	50	9.3%
5-9	52	9.7%
10-14	42	7.8%
15-19	27	5.0%
20-24	40	7.5%
25-29	55	10.3%
30-34	46	8.6%
35-39	31	5.8%
40-44	20	3.7%

HH members age groups	Total number of HH members	
	Person	Share
45-49	24	4.5%
50-54	42	7.8%
55-59	35	6.5%
60-64	28	5.2%
65-69	15	2.8%
70-74	5	0.9%
75-79	11	2.1%
80+	13	2.4%
Total	536	100.0%

The survey of beneficiaries HHs revealed that share of male population slightly prevails. From the viewpoint of income generation this does not mean anything; currently most of women are equally engaged in economic activities as men. Moreover, usually they take also housekeeping responsibilities over the income generation activities. Interestingly, this information does not reflect the permanent situation in surveyed communities. In the period of March-November a notable part of male population used to leave their HHs for the work migration.

Figure 14 - Gender

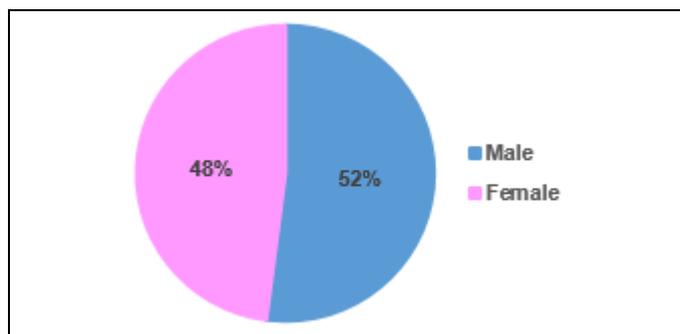
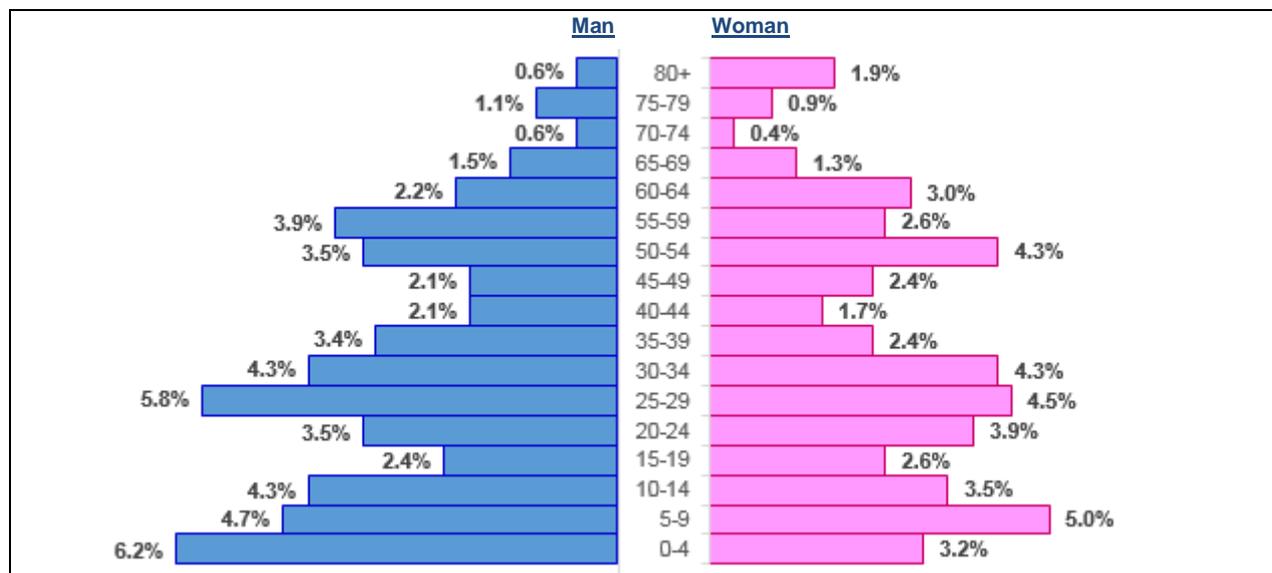


Figure 15 - The age pyramid of population (HH members)



Correlation and combination of age and gender information of the surveyed HHs members results in quite interesting findings. For some age groups there is a slight prevalence of male population upon the female population. This phenomenon is especially notable for the lower age groups. The situation may be partially explained by negative developments of gender control measures applied widely in Armenia in the recent period.

(ID30). Education level (Classification into categories). As it was already mentioned the total number of surveyed HHs members comprised 536 persons, including 379 adults (71%). Distribution of adult population by education levels is the following (see [Table 135](#)). The only major finding is that share of surveyed population having some professional qualification comprises only 34% in total number of adults.

Table 135 - Education level

Education level	Share in the number of HHs' adults
Elementary or no education (0-3 classes)	3%
Main (4-8 classes)	6%
Secondary (9-10 classes)	56%
Vocational	16%
University	18%
Total	100%

(ID31). Marital status (Classification into categories). As it was already mentioned the total number of surveyed HHs members comprised 536 persons, including 379 adults 71%. Distribution of adult population by marital status is the following (see [Table 136](#)).

Table 136 - Marital status

Marital status	Share in the number of HHs' adults
Married	76%
Single	16%
Divorced	1%
Widow(er)	8%
Total	100%

(ID32). Occupation (Classification into categories). Distribution of adult population by occupation is the following (see [Table 137](#)). The principle of data calculation is the following: *if the HH member is engaged in 2 workplaces (generates income from 2 different sources), the "higher/preferable" status of occupation is being registered.*

Table 137 - Occupation

Occupation	Share in the number of HHs' adults
Agriculture	15%
Permanent employment	9%
Temporary (seasonal) employment	20%
Permanent self-employment	2%
Temporary (seasonal) self-employment	3%
Unemployed, looking for job	5%
Student	5%
Pensioner	12%
Disabled	2%
Housekeeper	24%
Other	2%
Total	100%

(ID73). Women groups in target area (Number); (ID74). Youth groups in target area (Number); (ID75). Indigenous people inhabiting in target area (Number). The following table presented the availability of special groups of people in the targeted communities of the IWS sub-component implementation.

Table 138 - Women and youth groups and indigenous people in target area, 2016

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
Gegharkunik						
1. Dzoragyugh	0	0	0	0	0	0
Tavush						

Community	(ID73)		(ID74)		(ID75)	
	Women groups		Youth groups		Indigenous people	
	Number of groups	Number of members	Number of groups	Number of members	National minorities, person	Religious minorities, person
2. Archis	1	20	0	0	0	0
3. Debedavan	0	0	0	0	6	10
4. Haghtanak	1	13	0	0	0	0
5. Ltchkadzor	1	8	0	0	0	0
6. Ptghavan	0	0	0	0	18	0
Vayots Dzor						
7. Agarakadzor	0	0	0	0	4	3
8. Areni	1	35	1	40	0	0
9. Arin	0	0	0	0	0	0
10. Azatek	0	0	0	0	0	20
11. Getap	0	0	1	11	1	0
12. Rind	0	0	1	35	0	0
13. Vernashen	0	0	0	0	0	20
14. Yelpin	0	0	1	12	0	0
Total	4	76	4	98	29	53

The following clarifications should be provided to the information presented above:

1. Active Women Union of Archis was established by the Green Lane NGO²¹ with the purpose of launching berries' production, though they not doing anything now;
2. Women's Cooperatives in Haghtanak and Ltchkadzor have been established with the support of OXFAM GB - Armenia with the purpose of operating greenhouses in their communities;
3. The major objective of the Women's Group in Areni is the improvement of women's role in the community;
4. All 4 youth organizations operate in Vayots Dzor region. Their major objectives and engagement are: organization of events and festivals, public works and other measures (such as sanitary collection days), participate in public construction works (such as sports and entertainment facilities), etc.;
5. The number of people in national minorities is really small and they are living in just few communities. Among those minorities the prevailing are Yezidi (Kurds).

(ID78). Active service providers/donor organizations/ engaged in the communities (Number/scope of works). International and local development organizations are quite active in Armenia. Development initiatives largely target remote, bordering, and poor communities of Armenian regions, including many communities targeted by the RACP, too. Development initiatives are being funded and implemented by not only institutional specialized entities, but also various individuals and businesses. Availability of such initiatives in targeted communities and type of their intervention is presented below.

Table 139 - Development organizations and their programs in targeted communities

Community	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)
Gegharkunik				
1. Dzoragyugh				
Tavush				
2. Archis				
3. Debedavan				
4. Haghtanak	OXFAM GB - Armenia Establishment of greenhouses	Mikael Vardanyan Irrigation system reconstruction		

²¹ This NGO specializes in sustainable agriculture promotion activities

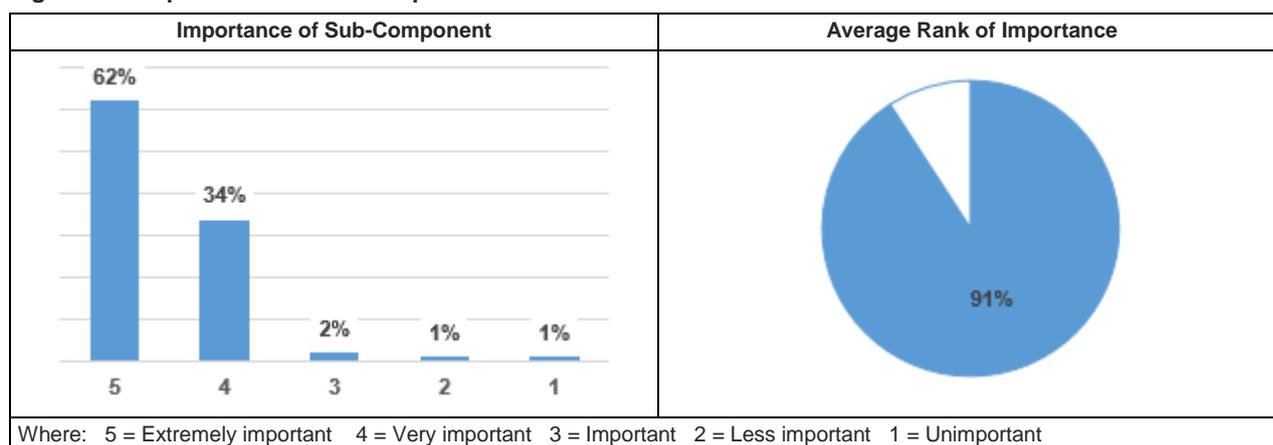
Community	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)	Donor organization (Program)
5. Ltchkadzor	OXFAM GB - Armenia Establishment of greenhouses	Save the Children Reconstruction of ambulatory, water supply	Individual benefactors (USA) Library reconstruction	Mikael Vardanyan Road reconstruction
6. Ptghavan	ASIF School repair	Government of France Kindergarten reconstruction		
Vayots Dzor				
7. Agarakadzor	Heifer Establishment of cold storage	Fuller Irrigation network construction	Apaven Foundation Drinking water pipeline rehabilitation	
8. Areni	Heifer Provision of animals	Fuller Internal irrigation system rehabilitation		
9. Arin				
10. Azatek				
11. Getap				
12. Rind	APIU Pasture improvement			
13. Vernashen				
14. Yelpin	OXFAM GB - Armenia Repair of 1,200m drinking water pipeline	Fuller Irrigation system construction	ENPARD Establishment of milk processing workshop	

The table above bases on information collected immediately from the municipalities and Governorates of respective regions, but does not cover all issues related to development initiatives. Some important notes include:

- Many development organizations implement their activities (also for specific communities) from Yerevan or capitals of regions. For example, World Vision is very active in all regions of Armenia through its ADPs, but may not have office or program exactly in a certain village, but target the whole region. The same is with MASCS (agricultural extension services) in regions.
- Many projects have been completed and representatives of communities simply did not mention them. For example, UNDP implemented quite a long-lasting and wide development program in Tavush, but none of respondents mentioned it.
- Local beneficiaries and stakeholders tend to forget about development initiatives of “soft” nature, such as trainings and other capacity building. But many organizations provide exactly such support.
- Some development organizations establish servicing organizations (such as Farm and Veterinary Service Centers) that provide their services not only to the population of the current location, but also other farmers from even other regions.

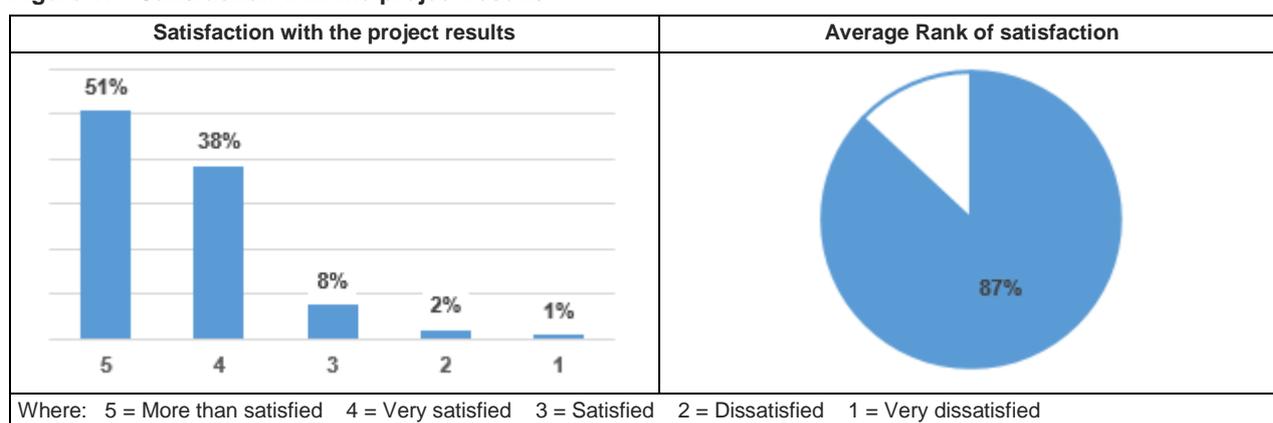
Importance of the IWS sub-component. Importance of the IWS sub-component was not included in the list of indicators initially provided in the ToR of the current IA. However, it was added during the discussions in the preparatory stage. Overwhelming majority of respondents ranked the inclusion of the IWS sub-component in the list of RACP activities as important and extremely important. In other words, revision of the RTI sub-component and its replacement with rehabilitation of irrigation systems was absolutely right and justified decision.

Figure 16 - Importance of Sub-Component



Satisfaction with the IWS sub-component implementation results. Assessment of the beneficiaries' overall impression and satisfaction with the results of the development interventions is always a challenging task. The biggest problem is in different interpretation of the attitude and practical impossibility of objective benchmarking. In such situations, the evaluators are left with the only option of relying on subjective feelings and attitude of respondents.

Figure 17 - Satisfaction with the project results



In case of the IWS sub-component implementation the conclusion is rather obvious: the extent of satisfaction among beneficiaries is very high. **The great majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.** The IA team did not address the reasons of being dissatisfied since the number of such beneficiaries is really few.

5.4.5 Wrap-Up Conclusion

The following conclusions can be made from the analyses presented above:

1. Currently, only 3 communities can be formally assumed as having completed results of the IWS sub-component. All households in the area can benefit from newly reconstructed networks.
2. . The volume of required water delivered has increased substantially, number of HHs with secure access to water has tripled, capacity of the irrigation systems has significantly increased, losses have decreased to 10%.
3. 92% of beneficiaries of the RACP IWS sub-component registered increase of assets, but only part of that increase can be attributed to the RACP implementation, since major results did not happen, yet.
4. Income of the surveyed beneficiaries grew for 35%, but only part of that increase can be attributed to the RACP implementation, since major results did not happen, yet.
5. 53% of beneficiaries reported about a rise of the land value and estimated that increase to be 87%. This increase is substantially conditioned by the irrigation infrastructure rehabilitation.

6. Significant improvement in the capacity of the IWS systems. Significant decrease of losses happened; in most cases the losses were eliminated totally. Use of irrigation water grew for 21% on average.
7. Changes in the structure of community specific crops towards introduction of higher-value types just started. In addition, cultivation area for other crops increased also implementation of the RACP results.
8. Market accessibility features' improvement became notable. However, that is just start and it is too early to summarize the results; real impact will happen, yet.
9. The infrastructure is being reconstructed as planned and serves the water users in the respective area. The average area served by one WUA staff member is within the normal range to operate effectively. Collection rates both for water and membership fees are quite close to 100%. WUA representatives are mostly confident, WUAs have the necessary resources to sustainably serve their communities.
10. Extent of satisfaction among beneficiaries is very high. The great majority of surveyed beneficiaries (in targeted communities with completed projects) expressed their satisfaction with results of the project.

Implementation of the IA was possible only in a very limited number of communities where the rehabilitation of the IWS infrastructure was completed and handed-over for further exploitation. In this situation it is very hard to provide really applicable recommendations. The only major wish picked from the beneficiaries and forwarded to the RAED PIU and IFAD is the continuation of the interventions. Interventions may continue both vertically (additional investments in the same communities) and horizontally (involvement of new communities in future projects). Good examples of interventions are rehabilitation and (re)construction of secondary and tertiary (in-community) irrigation channels, investments in transforming the irrigation infrastructure into gravity systems, application of modern solutions (such as drip irrigation), etc.

6 RACP OUTREACH

Table 140 - RACP Outreach

Marz / Community	Support to Fruits and Nut Sector				Rural Infrastructure															
					Public Utilities Investments												Value Chain Infrastructure			
	Fruit Armenia				Natural Gas Supply				Drinking Water Supply				Solar / Sanitation				Irrigation Water Supply			
	HHs	Population			HHs	Population			HHs	Population			HHs	Population			HHs	Population		
Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	
A. ARAGATSOTN	10	45	23	22	7,248	34,283	17,827	16,456	3,783	15,129	7,413	7,716	0	87	42	45	0	0	0	0
1. Aghdzq					436	2,062	1,072	990												
2. Alagyaz					90	426	221	204												
3. Aparan (Jalalyan, Poshter and Lusavorich blocks)					117	553	288	266												
4. Apnagyugh					120	568	295	272												
5. Aragats					550	2,602	1,353	1,249												
6. Aragatsavan	10	45	23	22	1,369	6,475	3,367	3,108	1,975	7,899	3,871	4,028								
7. Arayi					107	506	263	243												
8. Arteni					991	4,687	2,437	2,250	760	3,040	1,490	1,550								
9. Dashtadem					105	497	258	238												
10. Hartavan					160	757	394	363												
11. Karbi					60	284	148	136												
12. Kosh					500	2,365	1,230	1,135												
13. Kuchak					112	530	275	254												
14. Lusagyugh									270	1,081	530	551	-	87	42	45				
15. Nor Yedesia									353	1,410	691	719								
16. Ohanavan					280	1,324	689	636												
17. Sasunik					860	4,068	2,115	1,953												
18. Shenavan					299	1,414	735	679	425	1,699	833	866								
19. Talin					83	393	204	188												
20. Tsahgkashen					65	307	160	148												
21. Ujan					600	2,838	1,476	1,362												
22. Vardenis					134	634	330	304												
23. Vardenut					210	993	517	477												

Marz / Community	Support to Fruits and Nut Sector				Rural Infrastructure															
					Public Utilities Investments												Value Chain Infrastructure			
	Fruit Armenia				Natural Gas Supply				Drinking Water Supply				Solar / Sanitation				Irrigation Water Supply			
	HHs	Population			HHs	Population			HHs	Population			HHs	Population			HHs	Population		
Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	
B. GEGHARKUNIK	0	0	0	0	250	1,183	615	568	293	1,170	573	597	0	0	0	0	1,630	4,464	2,324	2,140
24. Artanish					250	1,183	615	568												
25. Dzoragyugh																	1,630	4,464	2,324	2,140
26. Ttujur									293	1,170	573	597								
C. LORI	0	0	0	0	115	544	283	261	2,175	8,698	4,262	4,436	0	16	8	8	0	0	0	0
27. Chochkan									490	1,960	960	1,000								
28. Dsegh									860	3,440	1,686	1,754								
29. Katnajur									528	2,110	1,034	1,076	-	16	8	8				
30. Mets Ayrum									297	1,188	582	606								
31. Shirakamut					65	307	160	148												
32. Spitak (Grigor Lusavorich district)					50	237	123	114												
D. SHIRAK	0	0	0	0	300	1,419	738	681	1,710	6,832	3,348	3,484	0	411	204	207	0	0	0	0
33. Anipemza									110	439	215	224		9	4	5				
34. Arevik									517	2,066	1,012	1,054								
35. Isahakyan									307	1,226	601	625	-	191	99	92				
36. Jrapı									305	1,220	598	622								
37. Norshen									255	1,019	499	520	-	211	101	110				
38. Sarnaghbyur					300	1,419	738	681												
39. Shirakavan									216	862	422	440								
E. SYUNIK	0	0	0	0	518	2,450	1,274	1,176	0	0	0	0	0	0	0	0	0	0	0	0
40. Khnatsakh					235	1,112	578	534												
41. Khoznavar					99	468	244	225												
42. Spandaryan					76	359	187	173												
43. Vaghatur					108	511	266	245												
F. TAVUSH	33	147	76	71	5,335	25,235	13,122	12,113	3,823	15,292	7,493	7,799	0	20	9	11	555	1,592	829	763
44. Aghavnavank					155	733	381	352												
45. Archis	13	58	30	28													66	191	99	92
46. Aygedzor					110	520	271	250												

Marz / Community	Support to Fruits and Nut Sector				Rural Infrastructure															
					Public Utilities Investments												Value Chain Infrastructure			
	Fruit Armenia				Natural Gas Supply				Drinking Water Supply				Solar / Sanitation				Irrigation Water Supply			
	HHs	Population			HHs	Population			HHs	Population			HHs	Population			HHs	Population		
Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	
47. Baghanis					262	1,239	644	595	241	964	472	492								
48. Bagratashen					980	4,635	2,410	2,225	355	1,420	696	724								
49. Berekamavan					275	1,301	676	624	78	312	153	159								
50. Debedavan	16	71	37	34	260	1,230	639	590									161	364	189	175
51. Deghdzavan					81	383	199	184												
52. Gandzakar									700	2,800	1,372	1,428								
53. Gosh					399	1,887	981	906												
54. Haghartsin									959	3,836	1,880	1,956								
55. Haghtanak																	130	422	220	202
56. Hovq					177	837	435	402												
57. Itsaqar					105	497	258	238												
58. Jujevan					140	662	344	318												
59. Khachardzan					142	672	349	322												
60. Koti					913	4,318	2,246	2,073												
61. Ltchkadzor																	72	276	144	132
62. Navur					294	1,391	723	667												
63. Ptghavan	4	18	9	9	312	1,476	767	708									126	339	176	163
64. Sevqar									700	2,800	1,372	1,428								
65. Vazashen									240	960	470	490	-	20	9	11				
66. Verin Karmiraghbyur									550	2,200	1,078	1,122								
67. Voskepar					304	1,438	748	690												
68. Voskevan					426	2,015	1,048	967												
G. VAYOTS DZOR	78	346	179	167	1,107	5,236	2,723	2,513	952	3,807	1,865	1,942	0	0	0	0	1,418	5,239	2,727	2,512
69. Agarakadzor																	200	1,030	536	494
70. Areni																	130	469	244	225
71. Arin	21	93	48	45													65	216	112	104
72. Arpi					63	298	155	143												
73. Azatek	11	49	25	24													180	596	310	286
74. Getap					210	993	517	477									185	570	297	273

Marz / Community	Support to Fruits and Nut Sector				Rural Infrastructure															
					Public Utilities Investments												Value Chain Infrastructure			
	Fruit Armenia				Natural Gas Supply				Drinking Water Supply				Solar / Sanitation				Irrigation Water Supply			
	HHs	Population			HHs	Population			HHs	Population			HHs	Population			HHs	Population		
Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	Total		Male	Female	
75. Gladzor									436	1,744	855	889								
76. Khndzorut	28	124	64	60																
77. Malishka					730	3,453	1,796	1,657												
78. Por					22	104	54	50												
79. Rind									516	2,063	1,011	1,052					350	1,316	685	631
80. Vernashen	18	80	42	38													48	114	59	55
81. Yelpin																	260	928	483	445
82. Zarithap					82	388	202	186												
Total (Armenia)	121	538	278	260	14,873	70,349	36,582	33,768	12,736	50,928	24,955	25,973	-	534	263	271	3,603	11,295	5,879	5,416

7 OVERALL CONCLUSION AND RECOMMENDATIONS FOR FUTURE INTERVENTIONS

Overall conclusion on the results of the RACP implementation is that performance is Unsatisfactory for the FA component, and Satisfactory for the Rural Infrastructure component. The IA implementation team registered all the findings regarding the reasoning of the non-achievement of the assigned results for the FA component from all stakeholders and implementers. Among others, the following was concluded:

1. Slow progress in launching the implementation from the very beginning: getting approvals from the GoA, formal establishment of FA, hiring of the personnel, conclusion agreements, allocation of co-funding of the GoA, long selection of chief technical advisor conducted by the IFAD, etc.
2. Slow and insufficient progress in selection of partnering farmers and land plots, conclusion of contracts with them, establishment of orchards.
3. General management process, including operation and effectiveness of the Board of Directors. Long delays in provision of approvals by IFAD for the procurement of various inputs.
4. Improper design of the Component 1 conducted by attracted international experts that were not sufficiently aware of local circumstances, including peculiarities of Armenian agricultural sector.
5. Absence of budget allocations for agricultural instruments and machines, often problems with irrigation water supply.

Situation is polar different in case of rural infrastructure rehabilitation component, including the sub-components of natural gas, drinking water, irrigation water supply, and pilot sanitation and solar heating projects. **Overall performance is satisfactory although many sub-projects were not yet completed. However, their path is positive and implementers assured that they will be completed as of the end of the RACP. Implementation of the rural infrastructure component ensured high effectiveness and outreach, but impact and sustainability issues can be discussed only for selected issues/indicators. Beneficiaries highly appreciate the interventions (with irrigation supply sub-component having highest ranks) and demand further investments and continuation of the support.**

Implementation of the RACP is not completed yet, but some important lessons can be picked-up already from the process and respective recommendations for future development interventions (with similar components as in the RACP) can be made. The following recommendations may allow to avoid mistakes/shortcomings faced in the course of the RACP implementation, ensure higher efficiency, better targeting and involvement of beneficiaries, wider outreach, earlier impact and higher sustainability of results, etc. In particular, the following recommendations (of strategic and tactical levels) are made:

1. **Assignment of exact, clear, unambiguous responsibilities of all operators in applied schemes.** One of the pre-conditions of failing the achievement of the FA objectives was exactly low efficiency/effectiveness (sometimes even absence) of the management and steering processes. Regretfully, it seems that nobody is going to take the real responsibility for non-achievement of the results of the component.
2. **Design of any intervention should base on (and be well justified with) very thorough assessment of needs of local beneficiaries.** Ensuring their involvement must be among the major tasks of any team designing interventions in local environment. Moreover, the structure and logic of designed interventions should be approved also by local and regional level stakeholders (those located closer to the ground and not only officials of various entities, State agencies, and organizations). This recommendation is important from the viewpoint of all components of the RACP, but goes vital for especially for the FA and NGS (sub-) components.
3. **Any pilot project is better to start small,** even if it is backed-up by successful implementation experience somewhere else. This equally relates to risks of the selection of intervention area, type, and groups of targeted beneficiaries and their involvement, exact activities' implementation process, management issues, further ownership development, etc. In a long-run this helps to identify also sustainability risks (O&M, environmental, social, etc.).
4. **Better assessment of external factors causing certain risks for the results of interventions should be made.** The best example is the growth of natural gas prices (fully imported from Russia and controlled by foreign capital), which made it unaffordable for many households although they are connected (or can get

easily connected) to the major supply infrastructure. This certainly downscopes the economic benefit and positive impact of investments.

5. **Design and development of relevant M&E framework consisting of only SMART²² indicators.** The M&E framework of the RACP does not fully meet this requirement. In the meantime, all the indicators should fit to the M&E requirements assigned for all projects funded by IFAD and its RIMS framework.
6. **Continuity of interventions should be ensured.** Many interventions have been designed (or at least certainly assumed) continuation. This equally relates to all interventions targeting infrastructure (re) construction and improvements. The necessity of such continuation, however, is especially high for the irrigation-related activities.
7. **Application of respective M&E tools, particularly implementation of properly planned and implemented Baseline, Mid-Term, and Final Assessments.** One of the major shortcomings of the RACP was absence of reliable baseline data and mid-term assessment. For such a large and lasting project importance of those measures is unarguable.
8. **Implementation of the measurement of the Project impact should be initiated and conducted well after the completion of activities and appearance of the first outputs.** Longer-term outcomes legitimately happen in at least one year, especially when it relates to agriculture and rural areas.

²² This acronym stands for Specific, Measurable, Achievable, Relevant, and Time-Bound