



Food and Agriculture
Organization of the
United Nations

Project Report

Nationwide integration of the Minimum Dietary Diversity-Women (MDD-W) indicator into the Household Budget Survey (HBS) in Tajikistan, 2016

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The project on the Integration of the Minimum Dietary Diversity-Women (MDD-W) into the Household Budget Survey in Tajikistan has been conducted by the Food and Agriculture Organization of the United Nations (FAO) and the Agency of Statistics under the President of the Republic of Tajikistan (AoS), with financial contributions from the European Union and FAO in the framework of the project *“Improved Global Governance for Hunger Reduction”*

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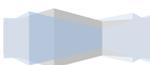
List of abbreviations

AoS	Agency on Statistics under President of the Republic of Tajikistan
DGLV	Dark Green Leafy Vegetables
DHS	Demographic and Health Survey
ESNA	Nutrition Assessment and Scientific Advice team based in FAO Rome
GBAO	Gorno-Badakhshan Autonomous Oblast
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
HBS	Household Budget Survey
HHIEq	Household Income Equivalent
MDG	Millennium Development Goal
MDD-W	Minimum Dietary Diversity-Women
MoH	Ministry of Health
RRS	Region of Republican Subordination
SFG	Standard Food Groups
SUN	Scaling Up Nutrition movement
WDDS	Women's Dietary Diversity Score



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1 Executive summary

Background: Tajikistan regularly conducts Household Budget Survey (HBS) at the national level. However, the Tajik HBS did not include any nutrition module at individual level. The Agency on Statistics under the President of the Republic of Tajikistan (AoS) and the Ministry of Health (MoH) requested FAO's technical support on the design and implementation of regular collection of nutrition data at national level. Therefore, the integration of a nutrition module such as the Minimum dietary Diversity- Women (MDD-W) indicator into the Tajik HBS would be of great importance for strengthening the country's national food security and nutrition information systems. Which in turn will be useful for informing decision-makers for policy action, target settings, design and implementation of nutrition/agriculture programmes and interventions for better nutrition.

Project aim: Nationwide integration of the individual-based MDD-W module into the national HBS in the five regions of Tajikistan: Khatlon, Sughd, Dushanbe, GBAO and RSS regions in Tajikistan. In order to set-up a national food security and nutrition information system for tracking nutrition progress.

Project design:

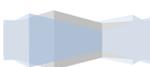
The project was undertaken in six phases: Phase 1. Preparatory phase for project implementation; Phase 2. Capacity development and adaptation of the dietary diversity questionnaire; Phase 3. Implementation of pilot studies; Phase 4. Refresher training courses on data collection, data analysis and development of a Monitoring and Evaluation (M&E) framework; Phase 5. Development of an M&E framework; Phase 6. Nationwide MDD-W data collection and implementation of an M&E framework. The present report presents a brief overview of phases 1 to 2, for which detailed information can be found in previously published reports, and provides detailed information on phases 4 to 6.

Results and discussion: In phase 4, three refresher training courses on MDD-W data collection were conducted along with two trainings on MDD-W data analysis. A total of 48 enumerators and 8 trainers participated in the trainings, their knowledge was refreshed and their skills for collecting MDD-W data were reinforced. MDD-W questionnaires and supporting materials that were adapted during the training courses in 2015, were validated by the participants of the refresher training to ensure that they reflect the Tajik cultural context i.e. dietary habits and common foods available in Tajikistan. Ten AoS staff were trained on how to conduct MDD-W data analysis and interpret results. In phase 5, an M&E framework was developed following a



participatory approach, where AoS staff with the technical assistance of FAO, defined and decided the indicators and target to be included in the framework. In phase 6, the nationwide MDD-W data collection was conducted in a sample size that accounts for approximately 65 % of the HBS sample. The nationwide data collection included 2031 women from the five regions of Tajikistan: 265 women in Dushanbe, 567 in Sughd, 600 in Khatlon, 400 in GBAO and 198 in RRS region. The survey also included women from urban and rural areas. The median score of MDD-W was 7 in the overall country and similar scores were found in Dushanbe, Sughd, Khatlon and GBAO. In RRS region the MDD-W score was significantly higher than the others, with a media value of 8. In the overall sample of Tajikistan 95% of the women had a MDD-W score of 5 or more, women meeting the minimum dietary diversity. The highest percentage of women who did not reach a minimum dietary diversity was found in Khatlon (10%) followed by GBAO (6.8%), while the percentages in Dushanbe (1.9%) and Sughd (1.1%) were relatively low and the lowest was in RRS (0.05%). The least consumed food groups were eggs, nuts and seeds. Women with higher household income and living in the urban areas showed a higher dietary diversity, and therefore they were more likely to meet their micronutrient adequacies compared to women living in rural areas with lower household incomes.

Conclusion: The project on the nationwide integration of the nutrition module MDD-W into Tajikistan's HBS system was successfully conducted. The integration process included: capacity development of enumerators and trainers on dietary data collection; adaptation of the MDD-W questionnaires and supporting materials to the local context in Sughd and Dushanbe regions; conduction of three pilot studies with subsequent data analysis, interpretation and reporting; development and implementation of an M&E framework to ensure that MDD-W data are of high quality and finally the upscaling of nationwide integration of the MDD-W into the regular HBS. The collected information would feed valuable information into the country's food security and nutrition information system in a practical and relative inexpensive way. Furthermore, it is recommended to adopt as a regular practice the MDD-W data collection across different regions of Tajikistan and during different seasons e.g. harvest and lean (season of food shortages), etc. In such a way, MDD-W can be used to collect data at national and decentralized level, as well as to identify regions and population groups who are at high risks of malnutrition due to inadequate dietary diversity and micronutrient inadequacies. The Ministry of Health and Social Protection in Tajikistan has decided to include MDD-W as one of the indicators for measuring nutrition progress of the Country's Sustainable Development Strategy – Goal 3 (2016-2030). Thus, MDD-W information would be useful for decision making by the government and for policy change towards a better nutrition.



2 Background

Tajikistan consists of five regions: Dushanbe the capital and four administrative regions which are Khatlon, Sughd, Gorno-Badakhshan Autonomous Oblast (GBAO) and the Regions under Republican Subordination (RRS) (Figure 1). Data from 2014 showed that the total population of Tajikistan was approximately 8 million people: 4.13 million were female (49.4%) and 6.1 million people (73.5%) lived in rural areas ⁽¹⁾, where it is often seen that the only paid jobs are for seasonal agricultural labours on cotton farms or unpaid workers tending household farms.

Tajikistan remains a low income country with a 'serious' food security issue according to IFPRI's Global Hunger Index ⁽²⁾. The latest report on poverty measurement in Tajikistan showed that 16.8% of Tajik people live below the extreme poverty line with limited access to nutritious food ⁽³⁾. A national poverty rate of 32% was reported, where the highest level was found in RRS region (37.8%), followed by Khatlon (37.7%) and GBAO (37.3%) and lowest poverty rates were in Sughd (23.1%) and Dushanbe (19.9%) ⁽³⁾. Poverty rate was also reported to be higher in rural areas (36.1%) than in urban households (23.5%) ⁽³⁾. Tajikistan is also a food-deficit country importing over half its consumption requirements, which exposes its population to global food price fluctuations and other external factors.



Figure 1. Tajikistan. Source AoS, 2012 ⁽⁴⁾

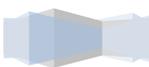
Tajikistan is the only country in Central Asia that has not yet achieved the Millennium Development Goal (MDG) of cutting by half the proportion of people who suffer from hunger by 2015 ⁽⁵⁾. Malnutrition levels are still a concern in Tajikistan, with acute malnutrition (wasting) affecting 10% of children under five, including 4% severely wasted. Chronic malnutrition (stunting) has not significantly changed since the last nationwide survey in 2005, with a prevalence of 26% as measured in the last

Demographic and Health Survey (DHS) in 2012 ⁽⁴⁾. The prevalence of micronutrient deficiencies in children and women called for attention: roughly 53% of children under five and 59% of women of reproductive age were iodine deficient. Anaemia is also a public health problem, with a prevalence of 24% amongst women of reproductive age and 29% in children 6-59 months. The highest levels of micronutrient deficiencies were found in GBAO and in RRS ⁽⁶⁾. There is a strong public health focus on maternal undernutrition due to its importance: it contributes to fetal growth restriction that increases the risks of neonatal death and stunting for the survivors ⁽⁷⁾, in particular among women of reproductive age (15-49 years) living in low resource settings, who are at a greater risk for multiple forms of malnutrition i.e. undernutrition, obesity and micronutrient deficiencies.

It has been shown that malnutrition can be passed on from one generation to the next, where malnourished women give birth to malnourished children who often grow up to become malnourished adults ⁽⁸⁾. Evidence has shown that the impact of malnutrition during the critical 1000 days, which starts from a woman's pregnancy through to a child's second birthday, can have permeate negative effects. Hence, childhood malnutrition is inevitably linked to the nutritional status of women at reproductive age ^(8; 9). Despite the high prevalence of undernutrition and micronutrient deficiencies, the rate of overweight and obesity has gradually increased in Tajikistan, as it has in many other developing economies. It was reported that 30% of women suffer from overweight and obesity, with higher rates in women living in urban areas (37%) compared with women living in rural areas (24%), these changes may be largely due to changes in food habits⁽⁴⁾.

The consequences of malnutrition can be devastating and the country's development targets might not be met if nutrition issues are not addressed in a timely manner. In response to the lack of updated nutrition information of women in Tajikistan and the alarming nutrition situation in the country, the Tajik government joined the Scaling Up Nutrition (SUN) movement in 2013, committing to improve nutrition for the people in Tajikistan. Furthermore, the government has prioritized the set-up of a national information systems to understand and monitor the quality and diversity of people's diets through the use of a simple and valid food-based indicator. The Ministry of Health (MoH) has requested AoS to collect national representative nutrition information in the country. In order to accomplish this task, AoS requested FAO to provide technical support in the implementation of regular nutrition data collection at national level.

Timely and accurate information on nutrition is the foundation on which effective policies and programmes can rely to improve food security and nutrition of the population. Dietary assessment methods are well known as one of the methods to



identify nutrition problems, the method is expensive, difficult to implement and time consuming. As an alternative dietary diversity indicators are proxy tools for dietary assessment, they are useful for making cross-country comparisons and estimating nutrition trends. Minimum Dietary Diversity Women (MDD-W) is a simple food-based tool for monitoring dietary changes of populations at country level, it provides proxy information on dietary diversity (key element of diet quality) and micronutrient adequacies. Inadequate and/or delayed information for the management of malnutrition and nutrition interventions projects and programmes has serious public health implications i.e. increase mortality and morbidity among women and young children perpetuating the cycle of poverty, hunger, impaired growth and poor health in low resource countries. National surveys are excellent tools to collect representative information on socio-economic and –demographic characteristics at national level, they can also collect information on health topics and consumption/expenditure and are good entry points to integrate dietary surveys.

Household Budget Survey (HBS)

HBS is a country representative surveys that is usually conducted at regular intervals (e.g. 2 -3 times per year) mainly focusing on household consumption and expenditure. HBS has not been specifically designed to act as a nutrition survey, however, it can be an important source of information on food availability and on the socio-economic factors that affect dietary choice. HBS presents several useful characteristics such as: standardized methodology, representativeness of the samples, large sample size and regular data updating ^(10; 11). In Tajikistan, the AoS has solid experience in conducting HBS at national level. HBS in Tajikistan has not yet included any nutrition module such as food consumption, or dietary information. Therefore, to integrate a nutrition module such as MDD-W into the Tajik HBS would be of great importance for strengthening the country's national food security and nutrition information systems.

Minimum Dietary Diversity - Women (MDD-W)

Proxy indicators to measure dietary diversity have been recognized as potential and simple tools to be used in different settings, in particular in resource-poor settings, to evaluate dietary diversity ⁽¹²⁾. Dietary diversity is an important element of dietary quality and it has been reported that the consumption of a higher number of food items and food groups is associated with a higher probability of improved micronutrient adequacy ^(13; 14).

Until 2014 the proxy tool to measure dietary diversity in women was the Women's Dietary Diversity Score (WDDS) ^(12; 15) developed by FAO and partners in 2010. WDDS



was constructed with the count of 9 food groups and it did not have any specific cut-off point. Based on the request from several users for the need of a dichotomous indicator, in 2012-14, FAO commissioned a project “Women’s Dietary Diversity Follow-up Project (WDDP-II)” with the aim to refine the WDDS ⁽¹⁶⁾. The output of the project was a new indicator developed through secondary analysis of nine datasets from rural and urban areas of six countries (Bangladesh, Burkina Faso, Mali, Philippines, Mozambique and Uganda) ⁽¹⁷⁾.

The new indicator “Minimum Dietary Diversity-Women (MDD-W)” has a cut-off point at five food groups out of 10 standard food groups that make up the indicator. The indicator determines the proportion of women 15–49 years of age who reach this minimum dietary diversity (five or more food groups) in a population ⁽¹⁸⁾. The 10 food group indicator are as follows:

1. Grains, white roots and tubers, and plantains
2. Pulses (beans, peas and lentils)
3. Nuts and seeds
4. Dairy
5. Meat, poultry and fish
6. Eggs
7. Dark green leafy vegetables
8. Other vitamin A-rich fruits and vegetables
9. Other vegetables
10. Other fruits

MDD-W can indicate the consumption of nutrient-dense foods and adequacies for eleven micronutrients (i.e. vitamin A, iron, thiamine, riboflavin, niacin, vitamin B-6, folate, vitamin B-12, vitamin C, calcium and zinc) ⁽¹⁷⁾. In particular, key food groups can be disaggregated to indicate vitamin A and iron consumption that are recorded in the MDD-W questionnaire as shown below:

- Vitamin A, question number and food groups:
 - Plant-based food groups:
 - Question 3, vitamin A-rich vegetables and tubers
 - Question 4, dark green leafy vegetables
 - Question 6, vitamin A-rich fruits
 - Animal-based food groups
 - Question 8, flesh food and organ meat
 - Question 9, eggs
 - Question 13, milk and milk products
- Iron, question number and food groups:
 - Animal-based food groups (haem iron, highly bioavailable):



- Question 8, flesh food and organ meat
- Question 9, eggs
- Question 10, fish and sea foods

The indicator provides valuable information on dietary diversity and probability of micronutrient adequacies, demanding relatively less resources and technical capacity compared to most traditional food consumption surveys that are usually labour intensive and demand significant technical capacity and financial resources. The MDD-W tool is particularly useful for assessing whether agricultural development, food security and nutrition education programmes and policies are effectively leading to more diverse and nutritious diets in the population. MDD-W has been selected as the tool to measure dietary diversity of women of reproductive age across the country, by integrating the indicator into the Tajik HBS.

Scope of the project

The present project was designed and implemented in order to achieve a nationwide dietary data collection, through the integration of the MDD-W module into the national HBS in Tajikistan. The project was conducted in the framework of the EU-FAO project “Improved Global Governance for Hunger Reduction”. The project was undertaken in six phases:

Phase 1. Preparatory phase for project implementation.

Phase 2. Capacity development and adaptation of the dietary diversity questionnaire.

Phase 3. Implementation of pilot studies

Phase 4. Refresher training courses on data collection, data analysis and development of a Monitoring and Evaluation (M&E) framework.

Phase 5. Development of an M&E framework

Phase 6. Nationwide MDD-W data collection and implementation of an M&E framework

In 2014, the three first phases of the project were satisfactorily conducted in the integration of the former WDDS into HBS in Khatlon region ⁽¹⁹⁾. In 2015, FAO was requested by AoS to provide further training to local AoS staff in a pilot data collection study to take place in the remaining region of the country i.e. Dushanbe, Sughd, GBAO and RRS. Thus, capacity development and pilot studies on the integration of MDD-W indicator into the HBS were conducted in all regions of Tajikistan. In 2016, phase 4 and 5 of the project were conducted, the present project report presents an overview of the

overall project and detailed information on the outputs of the last phases of the project. Detailed information on the previous phases of the project can be found in previous published reports ^(19; 20; 21; 22). This project provides evidence-base findings, best practices and lessons learnt that can be useful for policy makers from governmental institutions (such as the Ministry of Health, the Ministry of Agriculture, etc.), as well as for researchers, development partners or NGOs working in the field of food security and nutrition, to implement the MDD-W for tracking nutrition progress in different countries.

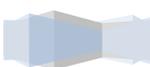
3 Project objectives

Overall objective

Nationwide integration of the individual-based MDD-W module into the national HBS in the five regions of Tajikistan: Khatlon, Sughd, Dushanbe, GBAO and RSS regions in Tajikistan.

Specific objectives of phase 4 and 5 of the project

- To refresh the capacity that was developed for Tajikistan to validate the MDD-W questionnaire and accurately assess nutritional impact of actions resulting from food and nutrition policies or interventions by using the MDD-W indicator.
- As part of the integration process, to conduct a nationwide data collection in all regions of Tajikistan. The objectives of the data collection are described below:
 - To evaluate the minimum dietary diversity of women of reproductive age in the five regions of Tajikistan Khatlon, Sughd, Dushanbe, RRS and GBAO regions in Tajikistan.
 - To determine the percentage of women that had a dietary diversity above the MDD-W cut-off (5 or more), as well as the percentage of women that had consumed food items in every standard food group.
 - To evaluate the women's consumption of nutrient-dense foods in areas of the pilot studies, which may have implications on micronutrient adequacies and health outcomes.
 - To investigate the associations between socio-economic and demographic characteristics of women in the pilot studies and their dietary diversity scores.



- Develop and implement an M&E framework to ensure that high quality MDD-W data are collected.

4 Project design and implementation

The AoS (<http://www.stat.tj/en/>) has been conducting HBS since 1995 on a quarterly basis. Currently, with the support of the World Bank, the modules and data collection methods of the HBS are under review with an introduction of new methods for sampling, data collection and analysis. Since 2009, AoS collects HBS four times per year with a coverage of 3000 households from urban and rural districts around the country. This sample size was designed to be representative at a national level. The households for the survey were selected by cluster randomization ⁽³⁾. Socio-economic and –demographic characteristics of the households are collected in the HBS and are used to study living standards of the Tajik population. HBS provides information on income, expenditure, consumption, and savings of different groups of the population⁽³⁾. The HBS covers all the 5 regions of Tajikistan. The sample distribution across the regions is: 900 households in Khatlon, 860 households in Sughd, 400 households in Dushanbe, 240 households in GBAO and 600 households in RRS ⁽³⁾.

Based on the vast experience of AoS in conducting HBS, and with the technical support from the Nutritional Assessment and Scientific Advice Team (ESNA)- FAO, the overall project on the nationwide integration of the MDD-W into the HBS was designed and implemented in five phases: 1) a preparatory phase for project implementation; 2) capacity development and adaptation of the dietary diversity tool and 3) implementation of pilot studies 4) refresher training courses on data collection, training on data analysis and M&E, 5) development of an M&E framework and 6) Nationwide MDD-W data collection and implementation of an M&E framework. The different phases of the project were implemented from 2014 to 2016, the timeline of the project is presented in Table 1. The present report provides detailed information on phases 4 to 6, with only brief information on phases 1, 2 and 3. Readers interested in learning more can find further information on phases 1 to 3 in previous published reports ^(19; 20; 21; 22).



Table 1 Timeline for the project implementation 'Integrating the MDD-W into the HBS in Tajikistan'

Phases	2014									2015									2016				
	4	5	6	7	8	9	10	11	12	4	5	6	7	8	9	10	11	12	5	6	7	8	9
Phase 1. Preparatory phase for project implementation	█																						
Phase 2. Capacity development and MDD-W adaptation				█						█													
a. In Khatlon Region				█																			
b. In Sughd Region										█													
c. In Dushanbe Region												█											
Phase 3. Implementation of pilot studies				█	█	█				█	█	█	█	█	█								
a. In Khatlon Region				█	█	█																	
b. In Sughd Region										█	█	█											
c. In Dushanbe, GBAO and RRS Regions													█	█	█								
Phase 4. Refresher training courses on data collection, data analysis and development of a Monitoring and Evaluation (M&E) framework.																						█	
Phase 5. Development of an M&E framework																						█	
Phase 6. Nationwide MDD-W data collection and implementation of an M&E framework																						█	█



Phase 1. Preparatory phase for project implementation

The preparatory phase was conducted in 2014, it included capacity mapping to identify the most suitable institution to undertake dietary data collection as well as to identify and define entry points where the dietary diversity indicator could be integrated. Details can be found in the previously published project report ⁽²³⁾.

As a result of the preparatory phase, the timeline for the project implementation in all regions of Tajikistan was agreed upon between AoS and FAO. It was decided that a 6-day training course on WDDS capacity development and pilot data collection would take place in Khatlon and based on that experience further trainings would be planned and leading to the undertaking of the first nationwide dietary data collection.

Phase 2. Capacity development and adaptation of the dietary diversity tool

In 2014, after the request from AoS, ESNA-FAO conducted a 6-day training course on dietary data collection, the training was held in Khatlon region. Specifically the training course was on the Women's Dietary Diversity Score (WDDS) to be integrated into the HBS.

In 2015, WDDS was updated to MDD-W and FAO along with AoS conducted two 5-day intensive training courses for capacity development of enumerators, trainers and government officials on applying MDD-W. One training course was conducted in Khujand of the Sughd region and the second one in the capital, Dushanbe. The training courses were designed to train enumerators and trainers from different parts of the country who had prior experience in conducting interviews and data collection.

The outputs of the activity include:

- 17 enumerators and 2 trainers trained in Sughd region
- 22 enumerators and 4 trainers trained in Dushanbe region
- The enumerators were fully equipped to apply the MDD-W in field surveys and the trainers would become facilitators in future training courses, to run pilot studies and data collection across the country.
- MDD-W questionnaires, instructions and supplementary materials in both English and Tajik were developed and used in the pilot studies.



- The adaptation procedure was performed, in each region, to ensure that the MDD-W questionnaire was relevant to the local food habits and included the local names of commonly consumed foods in the area.

The adapted tools and supporting materials along with further details about the lectures, exercises and practice carried out during the capacity development and adaptation process can be found in the previously published reports for the training course in Khujand ⁽²¹⁾ and in Dushanbe ⁽²²⁾.

Phase 3. Implementation of the pilot studies

Soon after each of the training course conducted in 2014, a pilot study was undertaken in Khatlon region as part of the integration process. Information on this pilot study can be found in the project report on the Integration of the Women's Dietary Diversity Score into the Household Budget Survey in Tajikistan, 2014 ⁽¹⁹⁾. Following a similar systematic approach taken in 2015, a pilot study was conducted as part of the integration process in the MDD-W into the HBS in the remaining parts of the country: Sughd, Dushanbe, GBAO and RRS.

The outputs of this phase include:

- In 2014, one pilot study was successfully conducted in Khatlon.
- In 2015, two pilot studies one in Sughd and the second in Dushanbe, GBAO and RRS, were successfully conducted.
- HBS data were collected using standard methods by AoS, women of reproductive age (about 30% of the total HBS sample) were interviewed and provided data on socio-demographic characteristics and food consumption as part of the MDD-W questionnaire. The number of women were distributed as shown in Table 2:
- Various conclusion and recommendation were drawn based on the dietary diversity results obtained from the pilot studies

A detailed report on these pilot studies can be found in the project report on the Integration of the Minimum Dietary Diversity-Women (MDD-W) into the Household Budget Survey (HBS) in Tajikistan, 2015 ⁽²⁰⁾.



Table 2. Sample size in a pilot studies conducted in five regions of Tajikistan

Location	Sample size for the National Survey (HBS)	% (HBS)	Sample size for the pilot study
Khatlon	900	30	300
Sughd	860	33	286
Dushanbe	400	31	133
RRS	600	34	202
GBAO	240	33	80
Total sample pilot studies			1001

Phase 4. Refresher training courses on MDD-W data collection and data analysis

In 2016, Tajikistan was ready to undertake a nationwide MDD-W data collection which would be integrated into the country's HBS. To ensure that all the enumerators have a clear understanding of the method and to validate their data collection skills, three refresher training courses were planned and implemented. It was also noted that data analysis, interpretation and reporting are three key elements for the successful integration of the MDD-W into national surveys. Therefore, two trainings on data analysis for AoS staff were also planned and conducted.

A. Refresher training courses on MDD-W data collection

The activity was organized by FAO and hosted by the AoS. Three refresher training courses on MDD-W data collection were conducted and attended by enumerators, M&E supervisors from each region, AoS staff and FAO staff:

- One refresher training held in Dushanbe on 21 July, where 15 enumerators and 4 trainers participated.
- One refresher training held in Sughd on 25 July, where 15 enumerators and 2 trainers participated.
- One refresher training held in Khatlon on 27 July, where 18 enumerators and 2 trainers participated.

A total of 48 enumerators and 8 trainers participated in the trainings with the aim to refresh their knowledge and reinforce their skills for collecting MDD-W data.



Specifically, participants’ knowledge on concepts, principles and application of MDD-W for assessing dietary diversity of women was reinforced and clarifications to any doubts and questions was provided. The MDD-W questionnaires, which were adapted during the training courses in 2015, were validated by the participants during the refresher training. As a results, AoS obtained a harmonized and valid MDD-W questionnaire and supporting materials to be used in each region of Tajikistan. The following materials were revised and validated for their use at national level in the different regions of Tajikistan:

- MDD-W questionnaire (Annex 1), the questionnaire includes:
 - Questionnaire on socio-demographic characteristics (i.e. living area (rural/urban), education level, marital status, number of children, etc.)
 - A qualitative open 24-hour recall questionnaire;
 - A 16–food group classification:

1. Cereals	9. Eggs
2. White roots and tubers	10. Fish and sea foods
3. Vitamin A-rich rich vegetables and fruits	11. Beans and peas
4. Dark Green Leafy Vegetables (DGLV)	12. Nuts and seeds
5. Other vegetables	13. Milk and milk products
6. Vitamin A-rich fruits;	14. Oils and fats
7. Other fruits	15. Sweets
8. flesh foods and organ meat	16. Spices, condiments, beverages
 - The 10-standard food group classification:

SFG-1. All starchy staples	SFG-6. Eggs
SFG-2. Beans and peas	SFG-7. Vitamin A-rich dark green leafy vegetables (DGLV)
SFG-3. Nuts and seeds	SFG-8. Other vitamin A-rich vegetables and fruits
SFG-4. All dairy	SFG-9. Other vegetables
SFG-5. Flesh foods	SFG-10. Other fruits



- A guide-form on how the 16-food group classification is aggregated into the 10-SFG (Annex 2).
- A list of the most consumed dishes classified by meals in Tajikistan (Annex 3)
- Instructions for administering MDD-W questionnaire (Annex 4).
- Frequently asked questions and answers for MDD-W assessment (Annex 5).

The questionnaires and supporting materials contain relevant information (i.e. dietary habits, common foods and meals) that reflect the food habits of Tajik population. All the material are available in Tajik and English languages. The validation exercise was useful to ensure that the questionnaires are context-specific and easy to administer by the enumerators. Socio-economic data such as the household income and number of household members were collected on the standard HBS questionnaire developed by AoS (<http://www.stat.tj/en/>).

At the end of the refresher trainings the participants expressed that they are able to properly collect and code MDD-W data in the field, as well as, to overcome challenges or difficulties encountered during field work. Participants felt confident to conduct the nationwide data collection in the following weeks.

B. Training on MDD-W data analysis and interpretation

Due to the importance of data analysis, interpretation and reporting additional time was devoted for intensive training on data analysis. Two trainings were conducted; one training course, where 10 AoS staff participated and one individual training with the person in charge of data entry and analysis in AoS

The training on data analysis covered the topics of data entry, coding, cleaning data and data analysis in Excel spreadsheets. The following points were highlighted:

- MDD-W data are collected and coded for the 16 food groups, which are then aggregated into 10 food groups to calculate the final score between 0 – 10 food groups.
- MDD-W has a cut-off point at 5 food groups, a score equal or higher than 5 indicates a higher probability that a woman meets the minimum dietary diversity than women eating 4 or less food groups.
- MDD-W results are useful to indicate:
 - Percentage of women consuming each food group
 - MDD-W frequencies by age, geographic location, season, socio-economic status and other variables.



- Households consuming food groups that are rich sources of specific nutrients (e.g. vitamin A).

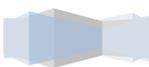
Furthermore, the participants were instructed on how to interpret and report the MDD-W results. Detailed information on the activities undertaken during the refresher training courses and during the data analysis training can be found in the training reports “Refresher Training for the Upscaling of Nationwide Minimum Dietary Diversity - Women (MDD-W) Data Collection and Data Analysis. Establishing an M&E Framework for Quality Data Collection in Tajikistan” ⁽²⁴⁾.

Phase 5. Development of an M&E framework

The development of an M&E framework to ensure that MDD-W data collected are of high quality followed a participatory approach. One M&E workshop and two round table meetings were conducted with the participation of AoS staff, which included:

- The presentation of basic concepts related to M&E along with the steps required to develop an M&E framework.
- Open discussions were held with AoS staff, M&E supervisors and a representative from the MoH (Dr. Sherali R. Rahmatulloev, Head of the Maternal and Child Health Care and Family Planning Department) to obtain information on what AoS is currently doing in terms of M&E for the HBS and what capacity they have now to include M&E of MDD-W into their current work.
- Discussions were focused on setting indicators that are in context specific and that are simple to collect, and specifically targeting those indicators where information is already being collected.
- Targets, means of verification and corrective actions to ensure MDD-W quality data were agreed upon.
- Establishing an M&E Committee to evaluate and discuss targets and provide recommendations for future data collection activities.

The output of the activity is the context-specific M&E framework to ensure MDD-W data collected are of high quality in Tajikistan. The framework is provided in Annex 6.



Phase 6. Nationwide MDD-W data collection and implementation of an M&E framework

The nationwide integration of the MDD-W into the HBS in Tajikistan would be of great importance to inform policies for food and nutrition security. It is necessary to collect information regarding the diet diversity of people in the household and to be aware of the families' capacity to maintain a diverse diet. Along with the nationwide MDD-W data collection. The M&E framework that was developed in the phase 5 was implemented to ensure that the MDD-W collected data are of high quality. The activities were conducted in accordance with the methods used by the AoS and following the steps shown below:

A. Planning of the nationwide MDD-W data collection and M&E

Study design and methods

A cross-sectional survey with 2031 women of reproductive age was conducted to collect data on MDD-W and HBS. The re-trained enumerators and trainers undertook data collection in rural and urban areas of the five regions of Tajikistan: Sughd, Dushanbe, Khatlon, GBAO and RRS regions.

Questionnaires and supporting materials

The necessary tools, to conduct the nationwide data collection were validated by the participants of the refresher training courses on MDD-W data collection during phase 4. Detailed information on the material development and adaptation can be found in the previous published training course reports in Khujand, Sughd ⁽²¹⁾ and Dushanbe ⁽²²⁾, and in the report of the refresher training courses conducted in the three regions of the country ⁽²⁴⁾.

Sample size

AoS, as part of the routine HBS data collection, has a database on all the households that take part in the HBS data collection. These households were selected by cluster randomization (Primary Sampling Unit (PSU) method) in all regions, including both rural and urban areas. Approximately 65% of the households included in the HBS, women of reproductive age (15-49 years old) were selected and interviewed for MDD-W data collection, as it is shown in Table 3.



Table 3. Sample size for the nationwide MDD-W data collection in Tajikistan

Location	Sample size for the National Survey (HBS)	% (HBS)	Sample size for the nationwide data collection
Dushanbe	400	66	265
Sughd	860	66	568
Khatlon	900	67	600
RRS	600	67	400
GBAO	240	83	198
Total sample size			2031

Data collection and monitoring

The enumerators from AoS were trained on dietary data collection on the 5-day training courses (details are presented in previous reports ^(21; 22)). Less than two weeks after the training courses, the enumerators collected information on HBS from the selected households and information on MDD-W from eligible women. A FAO national consultant, with technical backstopping from ESNA-FAO headquarters, monitored the progress of the two pilot studies. The consultant was in regular telephone contact to answer any questions, doubts or difficulties that the enumerators encountered and provided technical assistance. The data were collected at the end of harvest season August 2016.

The HBS data (<http://www.stat.tj/en/>) included household income and number of household members along with other socio-economic characteristics. Data on socio-demographic characteristics were collected on the structured questionnaire presented in Annex 1. Data on women’s socio-economic and demographic characteristics were useful to identify association with the dietary diversity scores.

To collect data on MDD-W, the previously adapted and validated questionnaire (Annex 2) was used. Data collection on MDD-W is based on a qualitative 24-hour recall, women were asked to report everything they had consumed the previous day (i.e. from the time getting up from bed in the morning until the time getting up again the next day) including both foods and drinks consumed at home and for reporting mixed dishes, all ingredients used needed to be disaggregated. A list of common mixed dishes with their ingredients was provided to the enumerators to help probe for possible missing ingredients (Annex 3). During data collection the minimum quantity rule has to be adhered, only the food items that were consumed in quantities more than 15-gram



(roughly a table spoon) were underlined/checked towards the 16-food group classification ^(18; 25). The food items that are underlined in the 16-group classification are then aggregated into the 10-SFG to construct the total score. Every food group in which at least one food item was underlined received the score of “1” otherwise a “0” was given, the scores of the food groups are summed up to get the total score, which can vary from 0 to 10. More details regarding how to collect and analyse data for dietary diversity and MDD-W can be found in recently published “Minimum Dietary Diversity for Women: A guide to measurement” ⁽¹⁸⁾.

Data management (data entry, cleaning, analysis, interpretation and report)

Upon completion of HBS/MDD-W data collection, the completed questionnaires were reviewed by AoS staff and the data were entered into Excel spreadsheets for calculation and data analysis. Data revision and data entry were undertaken by capable AoS staff in the central statistical office in Dushanbe. The Excel spreadsheets for MDD-W calculation were previously prepared by ESNA-FAO to allow for an automatic food group aggregation and count of the final MDD-W score. The Excel databases contained the following information:

- MDD-W scores of the interviewed women collected on the MDD-W questionnaire.
- Socio-demographic characteristics of the interviewed women, collected on the structured form for socio-demographic characteristics.
- Household income and number of household members collected on the HBS questionnaire.

The Excel databases were sent to ESNA-FAO headquarters, where the data were double checked to ensure data quality and the statistical analysis was performed. The data were checked for missing values and extreme outliers (box plots) and analysed using SPSS (SPSS Inc. version 18.0, Chicago, Illinois). To make household income comparable across households of different sizes (different number of household members) the household income equivalent (HHIEq) was calculated (total household income divided by the square root of the number of household members) ⁽²⁶⁾. The distribution of continuous variables (age, HHIEq) and MDD-W was inspected by kurtosis and skewness, the data were not normally distributed thus the results of these variables are presented as median and percentiles (25th, 75th).

The overall data were useful for the calculation of:



- Percentage of women that met the minimum dietary diversity, represented by women who had consumed foods listed in 5 or more SFG classification.
- Frequency and percentage of women who consumed each food group from the 16-food group classification and from the 10-SFG.
- Percentage of women who consumed nutrient-dense food groups (i.e. rich sources of specific micronutrients such as vitamin A and iron).
- Furthermore, bivariate analysis (*X² Chi square test*) was used to investigate the associations between women's socio-economic and demographic characteristics and their corresponding MDD-W scores.

The MDD-W scores were categorized in women who met the minimum dietary diversity (MDD-W \geq 5) and women who did not meet the cut-off (MDD-W $<$ 5). MDD-W score was used as categorical data to conduct cross-analysis with the categorical socio-economic and demographic characteristics. Continuous data (i.e. age and HHIEq) were divided by tertiles before the bivariate analysis. All the statistical tests were two-sided with a level of significance at $P < 0.05$.

B. Outputs of the nationwide MDD-W data collection

Socio-economic and demographic characteristics of the women

In Table 4, the socio-economic and demographic nominal-characteristics of women, who participated in the interview, are presented. The median \pm SD age of women in the overall sample was 33 \pm 9 years, women's age in the each region was in similar range. The data on household income and number of household members collected on the HBS questionnaire were used to calculate the household income equivalent (HHIEq) to allow for comparisons between the household incomes. Results showed that the median \pm SD HHInEq in the overall sample was 1032 \pm 1058 Somoni/month, equivalent to a median of 130 \pm 134 USD/month. The lower HHInEq was in average 481 Somoni/month, the medium HHInEq was 791 Somoni/month and the higher tertile of HHINEq was at 1828 Somoni/month. HHInEq results disaggregated by region showed that RRS reported the lower HHInEq yet this region reported the higher dietary diversity scores.



Table 4. Socio-economic and demographic characteristics of women (Nominal)

Characteristics	Tajikistan	Dushanbe	Sughd	Khatlon	GBAO	RRS
	Mean \pm SD					
Age, y	32 \pm 9	32 \pm 9	32 \pm 9	32 \pm 9	32 \pm 10	32 \pm 9
HHIEq, Somoni/month	1032 \pm 1058	1077 \pm 1106	1410 \pm 963	779 \pm 476	959 \pm 898	733 \pm 328
Low tertile	481	501	475	489	478	449
Medium tertile	791	823	801	776	788	765
High tertile	1828	1673	2176	1458	1693	1234

Table 5 presents the socio-economic and demographic categorical-characteristics of women, who participated in the interview. The majority of the interviewed women in Tajikistan (64%) were housewives, while others were office workers (20%) or had other occupations (16%) (e.g. students, farmers, etc.), same trend was follow in the other regions but RRS, where the distribution was even within the three categories. Most of the women (~90%), in the nationwide survey, reported to be responsible of food preparation in the family and the rest reported to be partially or not responsible of food preparation. About 80% of the interviewed women were married and had between 1 to 3 children and at the time of the interview 4% of the women were pregnant and about 9% were lactating.

Regarding education level, about 50% of the women had reached a secondary education (up to 11 years of study), approximately 20% of the women reported to have a higher education with the highest percentage in RRS. Concerning the living area (urban/rural), in the overall sample 62% of the women were from rural areas. However, the sample distribution between rural and urban areas was not even in all the regions: In Dushanbe 0% households were in rural areas, in Sughd 62%, in Khatlon 73%, in GBAO 80% and in RRS 75%. Thus, careful interpretation of the results is advised, as uneven sample distribution may induce bias.

Table 5. Socio-economic and demographic characteristics of women (Categorical)

Characteristics	Tajikistan	Dushanbe	Sughd	Khatlon	GBAO	RRS
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Occupation						
Housewife	1290 (64)	158 (60)	311 (55)	407 (68)	342 (86)	72 (36)
Office worker	413 (20)	60 (23)	173 (31)	73 (12)	40 (10)	67 (34)
Others ¹	326 (16)	47 (18)	83 (15)	119 (20)	18 (5)	59 (30)
Number of children						



Without children	484 (24)	83 (31)	100 (18)	144 (24)	83 (21)	74 (37)
1 to 3 children	1141 (56)	145 (55)	409 (72)	269 (45)	214 (53)	104 (53)
More than 3 children	404 (20)	37 (14)	58 (10)	186 (31)	103 (26)	20 (10)
Marital status						
Non married ²	444 (22)	81 (31)	83 (15)	132 (22)	84 (21)	64 (32)
Married	1585 (78)	184 (69)	484 (85)	467 (78)	316 (79)	134 (68)
Education level						
Primary	380 (19)	50 (20)	60 (11)	115 (19)	153 (38)	2 (1)
Secondary	1207 (59)	150 (57)	354 (62)	402 (67)	202 (51)	99 (50)
Above secondary ³	442 (22)	65 (25)	153 (27)	82 (14)	45 (11)	97 (49)
Pregnancy						
Non-Pregnant	1940 (96)	264 (99.5)	548 (97)	553 (92)	377 (94)	198 (100)
Pregnant	89 (4)	1 (0.5)	19 (3)	46 (8)	23 (6)	0 (0)
Lactating						
Non-lactating	1484 (91)	265 (100)	508 (90)	544 (91)	338 (85)	193 (98)
Lactating	180 (9)	0 (0)	59 (10)	55 (9)	61 (15)	5 (2)
Responsible of food preparation						
Yes	1829 (90)	255 (96)	539 (95)	506 (85)	351 (88)	178 (90)
No and partially	200 (10)	10 (4)	28 (5)	93 (15)	49 (12)	20 (10)
Living area						
Rural	1256 (62)	0 (0)	349 (62)	439 (73)	320 (80)	148 (75)
Urban	773 (38)	265 (100)	218 (38)	160 (27)	80 (20)	50 (25)

*P (25th, 75th), percentiles at 25% and 75%.

HHIEq, Household Income equivalent. ¹Other occupation includes farmers, cleaners, students, etc.²Non married includes single, divorce and widow. ³Above secondary includes university and higher education

Minimum Dietary Diversity-Women scores

The collected MDD-W data was double checked and cleaned, 2 MDD-W missing values were found and deleted from the database. One missing value in Sughd and one in Khatlon, the resulting sample size was in Sughd 567 and in Khatlon 599 women. In regards to data collected in the HBS questionnaire (i.e. household income and number of household members), 44 missing values were found. Data were cleaned and 1987 values of household equivalent income were computed in the analysis. Results of the median and percentiles (25th, 75th) of the dietary diversity score (MDD-W) of the interviewed women in Tajikistan and in the different regions are shown in Table 6. In Tajikistan the median MDD-W score was 7 with the interval 25th to 75th at 6 and 8. The highest MDD-W score was found in RRS with a median value of 8 with an interval at 7 and 8. The results differ from those found during the pilot studies conducted in 2015, where the RRS presented one of the lowest MDD-W reported values. The Table 6 also presents the percentage of women who have met the

minimum dietary diversity as determined by the percentage of women who had a MDD-W of 5 or more (MDD-W cut-off).

Table 6. MDD-W scores from the nationwide data collection in Tajikistan

Region	MDD-W		Percentage of women (%)	
	Median	P (25 th , 75 th)*	Below cut-off	Equal or above cut-off
Overall Tajikistan (n=2029)	7.0	6.0, 8.0	4.5	95.5
Dushanbe (n=265)	7.0	7.0, 8.0	1.9	98.1
Sughd (n=567)	7.0	6.0, 8.0	1.1	98.9
Khatlon (n=599)	7.0	5.0, 8.0	10.0	90.0
GBAO (n=400)	7.0	6.0, 8.0	0.5	95.5
RRS (n=198)	8.0	7.0, 8.0	6.8	93.3

MDD-W, Minimum Dietary Diversity-Women.

*P (25th, 75th), percentiles.

Percentage of women that had a dietary diversity score equal or above the cut-off

Figure 2 shows the frequency and percentages of women’s MDD-W at national level (overall sample). Among all women from Tajikistan, 4.5% had a MDD-W below the cut-off of 5 and 95.5% had a MDD-W equal or above the cut-off.

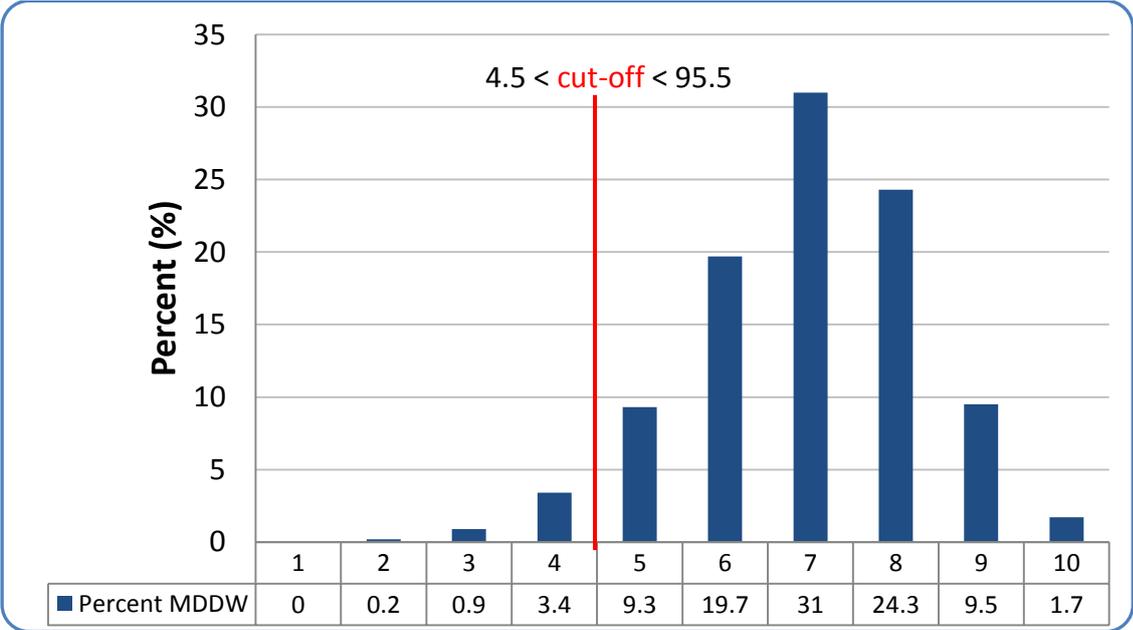


Figure 2. MDD-W scores in the five regions of Tajikistan

An analysis of disaggregated data by region is presented in Figure 3, the frequency and percentage of women’s MDD-W in each one of these regions is indicated. The higher percentage of women who have not reached a minimum dietary diversity was in Khatlon (10%), followed by GBAO (6.8%) and Dushanbe (1.9%). The region with the lowest percentage of women who did not reach the minimum dietary diversity was found in RRS, where on 0.5 % of women (1 women), in the previous pilot study in this region was found that 12% of women did not meet the MDD-W, which might indicate that the dietary diversity in RRS region has improved. Women that have reached a minimum dietary diversity, meaning having consumed foods from 5 or more standard food groups, have a greater likelihood of meeting their micronutrient requirements when compared to women who consumed foods from fewer food groups.

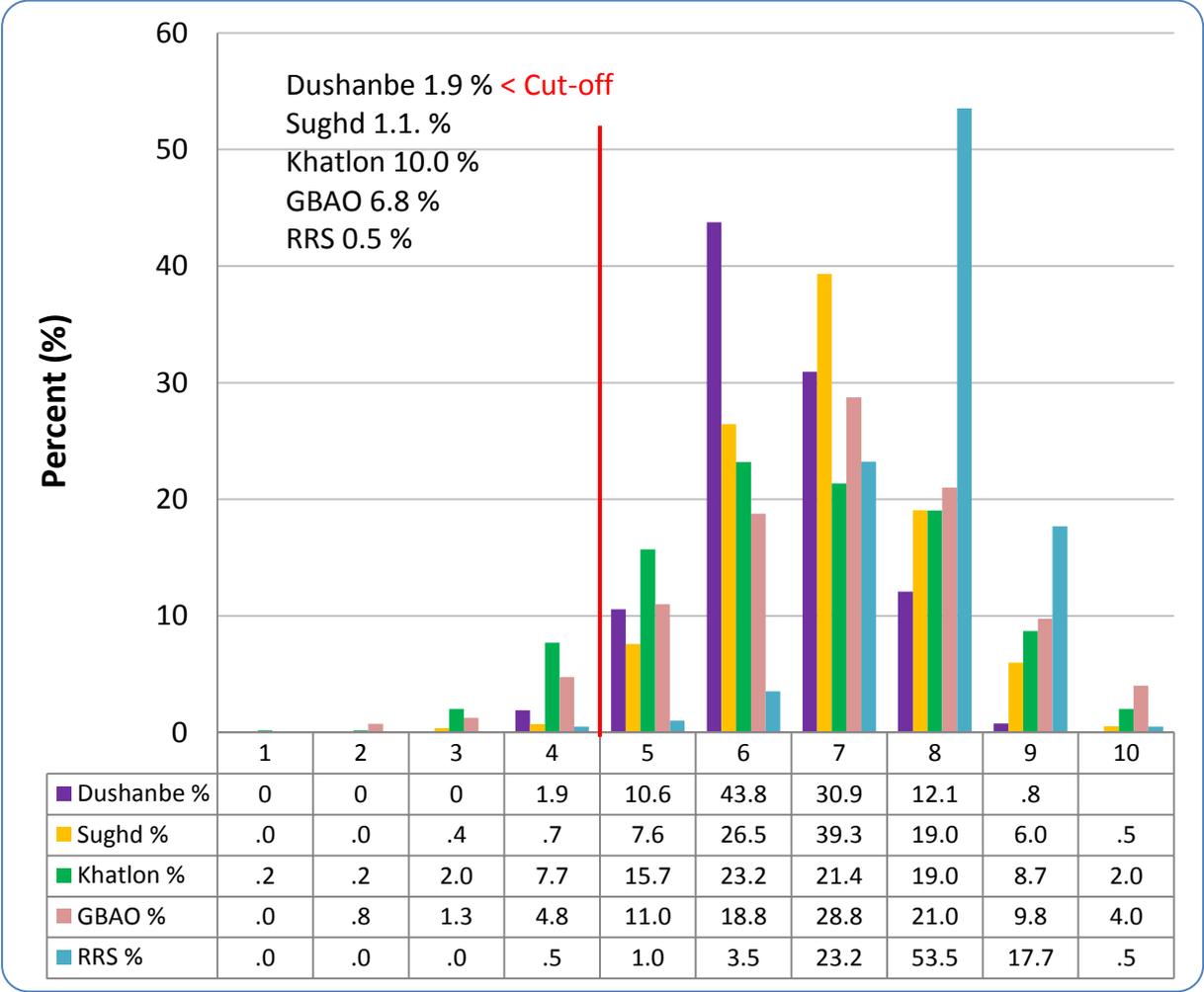


Figure 3. MDD-W scores disaggregated by regions: Dushanbe, Sughd, Khatlon, GBAO and RRS



Percentage of women that had consumed every Standard Food Group (SFG) the day before the MDD-W interview, disaggregated by meeting the MDD-W cut-off point or not

The consumption of each SFG that contributes to the construction of the MDD-W and for reaching the cut-off can be observed in Figure 4. The diet of the target population was based on starchy staples, which were consumed by 100 % of the women, and other vegetables consumed by more than 95% of the women. Other vitamin A-rich fruits and vegetables, other fruits, flesh foods and dairy products were consumed by more than 50% of the women in the overall sample.

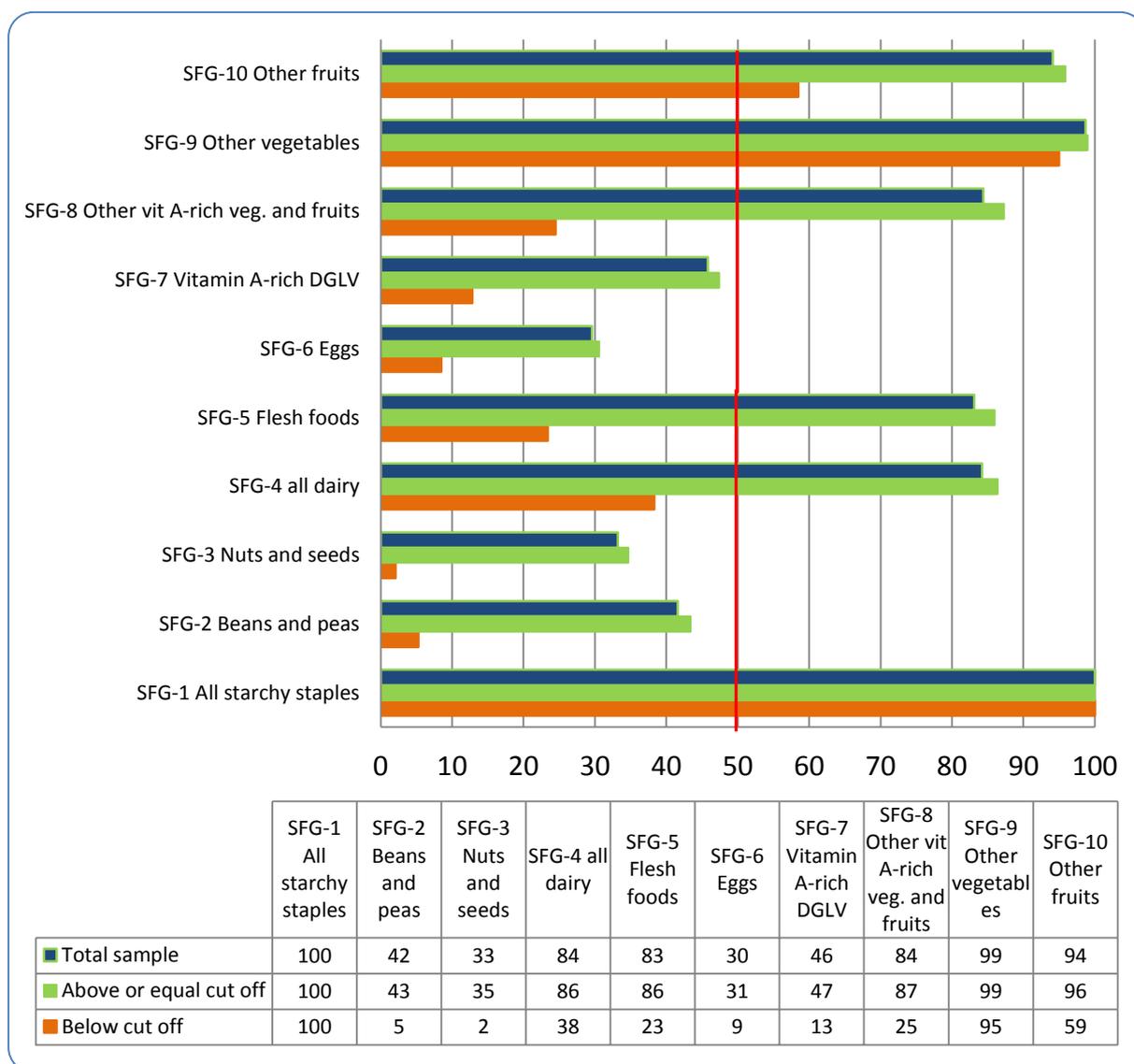


Figure 4. Percentage of women who consumed different food groups

Figure 4 also shows the percentage of women who consumed the different food groups and reached the MDD-W (above or equal the cut-off ≥ 5) and food groups that were



consumed by women who did not reach the MDD-W (below the cut-off < 5). Less than 50% of women who did not reach the minimum MDD-W (below the cut-off) had consumed vitamin A-rich fruits and vegetables, DGLV, dairy products, eggs flesh foods, nuts, seeds and legumes. Basically women who did not reach the MDD-W had a diet based on only 3 food groups i.e. starchy staples, other vegetables and other fruits. It calls for attention that nutrient-rich foods groups such as eggs, nuts, seeds and legumes were consumed by less than 10% of the women in this group.

Women who did not reach the MDD-W in the pilot studies (2015) ⁽²⁰⁾ had reported no consumption of nuts and seeds, in the present data collection the consumption of nuts and seeds has slightly increased to 2%. Promoting the consumption of nutrient-rich foods like nuts and seeds, beans and peas and eggs and DGLV is very important, especially for women who did not meet the MDD-W cut-off in order to help them to achieve an adequate MDD-W and increase their likelihood of achieving micronutrient adequacies. Eggs, beans and nuts are nutrient-dense foods, which are rich sources of protein and micronutrients at a more affordable price than meat, fish or flesh foods. The promotion of these foods among Tajik women is highly recommended.

Percentage of women that had consumed every Standard Food Group (SFG) the day before the MDD-W interview disaggregated by region

RRS region had shown to have a good MDD-W with consumption of most of the food groups by more than 50% of the women (Figure 5), except for the consumption of eggs which was somehow lower in RRS. Only 8% of the women in RRS consumed eggs, compared to 50% in Dushanbe, 39% in GBAO, 28% in Sughd and 24% in Khatlon. In regards to consumption of seeds and nuts, it was considerably lower in Dushanbe (only 5%) compared with the other regions, where the consumption was 25% in GBAO, 27% in Khatlon, 46% in Sughd and the highest 70% in RRS.

Careful interpretation of the results is advised and readers should bear in mind that data collection was conducted at the end of harvest season (August), results can be different when data is collected in the lean season or in a season when food shortages could be experienced. Seasonal variations have been shown to have an effect on dietary diversity⁽²⁷⁾. The difference in food consumption between one region and the others may be due to the geographical location of the areas, and socio-economic and demographic characteristics of the populations. In addition, food availability and food access together with food choices may also influence the consumption of food from different groups.



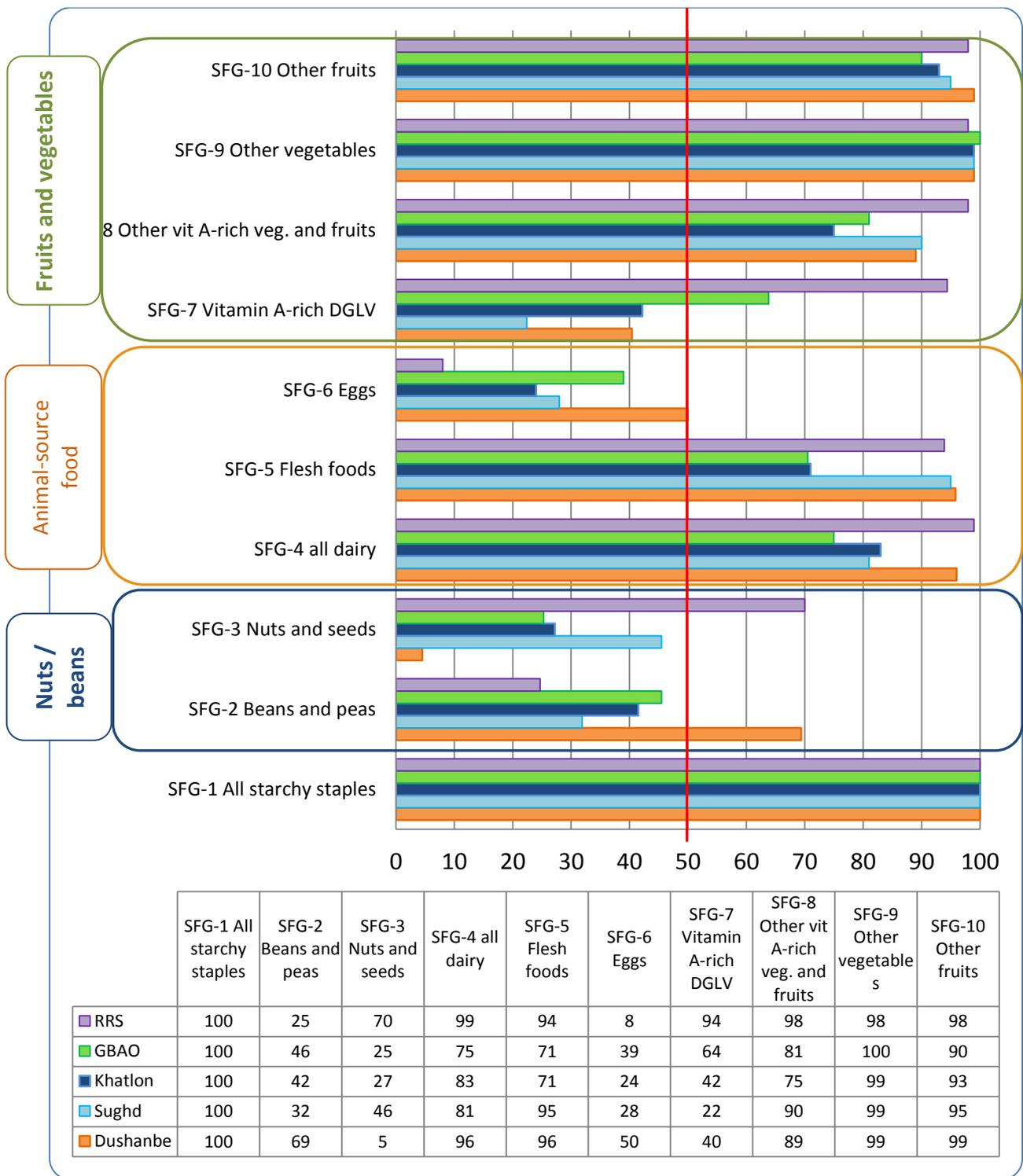
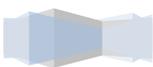


Figure 5. Nutrient-rich food groups consumed by 50 percent or more women the different regions: Sughd, Dushanbe, Khatlon, RRS and GBAO regions



Consumption of nutrient-rich food groups. Implications for micronutrient adequacies.

Consumption of certain nutrient-rich food groups (as shown in Figure 5) are important to reach a micronutrient adequacy, for example:

- Consumption of fruits and vegetables contribute to the adequacy of minerals and vitamins (i.e. vitamin C, E, pro-vitamin A, carotenes, etc.), these micronutrients are known as promoters of health and protective antioxidants against human cancers^(28; 29). Figure 5 (green box) shows the percentage of women consuming foods from food groups rich in vitamins and minerals. In the nationwide MDD-W data collection, it was reported that more than 50% of all women in all regions consumed other fruits, other vegetables and vitamin A-rich fruits and vegetables. However, consumption of DGLV in Sughd, Dushanbe and Khatlon was less than 50%, in particular in Sughd, where only 22% of the women consumed vitamin A-rich DGLV. The adequate consumption other fruits and vegetables was expected as the MDD-W interviews were carried out at the end of the harvest season in the other regions. MDD-W evaluation is repeated during lean season, the results may be different. As for the low consumption of DGLV, it can be due to systematic errors in collecting MDD-W data or random errors due to food preferences of the respondents.
- Consumption of animal-source foods (Figure 5, orange box) provides an important source of protein, iron and vitamin A. These foods provide highly bioavailable iron (hem-iron) needed to overcome problems of iron deficiencies and anaemia ^(30; 31). The percentage of women consuming flesh foods (which include meat, organ meat, fish and seafood) and dairy foods was more than 50% in all the regions. However, the consumption of eggs was less than 50%: egg consumption the day before the interview was shown to be an average of 30% Tajikistan: 50% in Dushanbe, 39% in GBAO, 28% Sughd, 24% in Katlon and the lowest 8% in RRS. These results can be due to the geographical characteristics of every region, which might determine the availability of these food items. The results of animal-source food consumption are in accordance with the results of a food security report, published in 2015 by the AoS ⁽³²⁾, where it was indicated that the production of key animal-source foods (meat, eggs and milk) was much higher in Sughd and Dushanbe when compared to GBAO, Khatlon and RRS ⁽³²⁾.
- Consumption of legumes, nuts and seeds (Figure 5, blue box) is important for the intake of essential minerals (i.e. zinc, iron, selenium) and B-vitamins as well



as plant-based proteins ^(33; 34). Beans and peas were consumed by more than 50% of women in Dushanbe but the consumption was lower in the other regions GBAO (46%), Khatlon (42%), Sughd (32%) and RRS (35%). Regarding nuts and seeds, this was the food group that was least consumed the day before the interview in all the regions (46% in Sughd, 27% in Khatlon, 25% in GBAO and 5% in Dushanbe) except in RRS, where nuts and seeds were consumed by 70% of the respondents, the results can be due to higher availability of this food in RRS, respondent's food preferences and/or systematic errors in MDD-W data collection.

In addition, previous studies have suggested that the consumption of dark green leafy vegetables and vitamin A-rich fruits and vegetables were positive predictors of vitamin A adequacy, and the food group-meat/fish was a good predictor of the probability of iron adequacy ^(15; 35). Promotion of diverse diets is one of several approaches to improving micronutrient adequacy and reducing deficiencies (other strategies are fortification, biofortification and/or supplementation). Moreover, diet quality is multidimensional, in addition to micronutrient adequacy, high-quality diets are characterised by balance in intake of protein (meat products, fish, organ meat), slow carbohydrates (fruits and vegetables) and fats (meat products, fish) and moderation in consumption of nutrient-low foods such as starchy staples, which in high quantities have been associated with increased risks for chronic disease such as obesity.

Associations between MDD-W and socio-economic and demographic characteristics

Results of binary associations between different MDD-W scores and the socio-economic and demographic characteristics of the women are shown in Table 7. Results indicated that the associations between MDD-W scores and the characteristics rural/urban areas and HHIEq were highly significant at a level $P < 0.001$ in the overall sample (n=2029). These associations were highly significant in most of the regions of Tajikistan: Sughd, GBAO and RRS. Women from higher household income, living in urban areas presented a higher MDD-W score. These differences might be explained due to the nutrition transition effect, which is undergoing in Tajikistan and implies that households with higher incomes tend to diversify their diet by increasing the consumption of food from different groups ⁽³⁶⁾. These findings are in line with previous studies that found associations between socio-economic and demographic characteristics and dietary diversity scores, especially between dietary diversity and living area, household income and education level in low-resource settings such as Bangladesh and Ethiopia ^(36; 37; 38; 39).



Table 7. Associations between MDD-W and socio-economic and demographic characteristics in Tajikistan and by region

Characteristics	Chi- square (<i>P</i> values) ^{a*}					
	MDD-W Tajikistan n= 2019	MDD-W Dushanbe n= 265	MDD-W Sughd n= 567	MDD-W Khatlon n= 599	MDD-W GBAO n= 400	MDD-W RRS n= 198
Occupation	--	31 (0.001)	31 (0.006)	--	37 (0.002)	--
Number of children	49 (<0.001)	--	31 (0.005)	33 (0.017)	--	--
Marital status	29 (0.001)	--	--	24 (0.004)	--	14 (0.030)
Education level	32 (0.022)	--	--	--	--	26 (0.012)
Pregnancy	--	--	--	--	--	--
Lactating	--	--	--	--	--	--
Responsible food preparation	20 (0.017)	17 (0.004)	17 (0.016)	30 (<0.001)	--	16 (0.011)
Rural/urban areas	70 (<0.001)	--	24 (0.001)	--	27 (0.001)	46 (<0.001)
Age (tertiles)	--	--	--	--	--	--
HHIEq ^b (tertiles)	72 (<0.001)	--	44 (<0.001)	--	48 (<0.001)	--

MDD-W, Minimum Dietary Diversity-Women

HHIEq, Household Income Equivalent

^aA Chi-square test was used to evaluate the bivariate association. MDD-W, age and HHIEq were evaluated as categorical variables after being classified in tertiles

Significant association were defined at $P < 0.05$

Education level (Table 7) showed to be significantly associated with MDD-W for the analysis of the overall sample and for RRS region with the significance levels at $P = 0.022$ and $P = 0.012$ respectively. The characteristics responsible of food preparation was associated with the MDD-W scores (from $P < 0.001$ to $P = 0.011$) in the overall sample and across all the regions, except RRS. The other socio-demographic characteristics such as women's occupation, number of children and marital status showed to be associated in a less significant level. As for the physiological status (pregnancy, lactating and age) did not show any significant association with the MDD-W outcome.



Associations between consumption of nutrient-rich food groups and socio-economic and demographic characteristics

The consumption of all the nutrient-rich food groups was strongly associated with rural/urban areas and/or HHIEq but the associations were less significant for educational level nor with other characteristics which were not included in the table (Table 8).

Table 8. Associations between consumption of nutrient-rich food groups and main socio-economic and demographic characteristics in Tajikistan

SFG consumed in all the regions (n=701)	Chi-square (<i>P</i> values) ^{a*}		
	HHIEq	Rural area	Education level
SFG-2 Beans and peas	--	9 (0.003) ↓	10 (0.008) ↑
SFG-3 Nuts and seeds	9 (0.009) ↑	--	--
SFG-4 All dairy	--	53 (<0.001) ↓	11 (0.004) ↑
SFG-5 Flesh foods, includes organ meat, fish, etc.	58 (<0.001) ↑	64 (<0.001) ↓	31 (0.004) ↑
SFG-6 Eggs	21 (<0.001) ↑	--	--
SFG-7 Vitamin A-rich green leafy vegetables	--	6 (0.013) ↓	--
SFG-8 Other vitamin A rich fruits and vegetables	24 (<0.001) ↑	18 (<0.001) ↑	12 (0.002) ↑
SFG-10 Other fruits	12 (0.002) ↑	6 (0.016) ↓	--

SFG, Standard Food Groups. **HHIEq**, Household Income Equivalent

*For the overall sample (includes data from both pilot studies) Chi-square test was used to evaluate the bivariate association. MDD-W, age and HHIEq were evaluated as a categorical variable, divided in tertiles. Significant association were defined at $P < 0.05$. The analysis was not performed for SFG-1 (starchy staples) and SFG-9 (other vegetables) because these groups were consumed by 100% and 99% respectively.

Household income equivalent (HHIEq) effect on MDD-W score and consumption of nutrient-rich food groups

The main determinants for achieving a minimum MDD-W (i.e. rural/urban, HHIEq and educational level) were tested for significant differences in the consumption of the food groups as shown in Table 8. The associations were investigated in the overall sample, (n=2029). To allow for associations of food groups with HHIEq, the HHIEq was divided into tertiles: low, medium and high, with approximately 660 women in each tertile.

Figure 6 shows the distribution of MDD-W scores, more women who reported a low HHInEq also reported a lower MDD-W compared with women in the medium or high HHInEq. A higher percentage of women (8.7%) with low HHInEq did not meet the MDD-W, this percentage was lower (3.4%) for women with medium HHInEq and the lowest for women (2.2%) with high HHInEq.

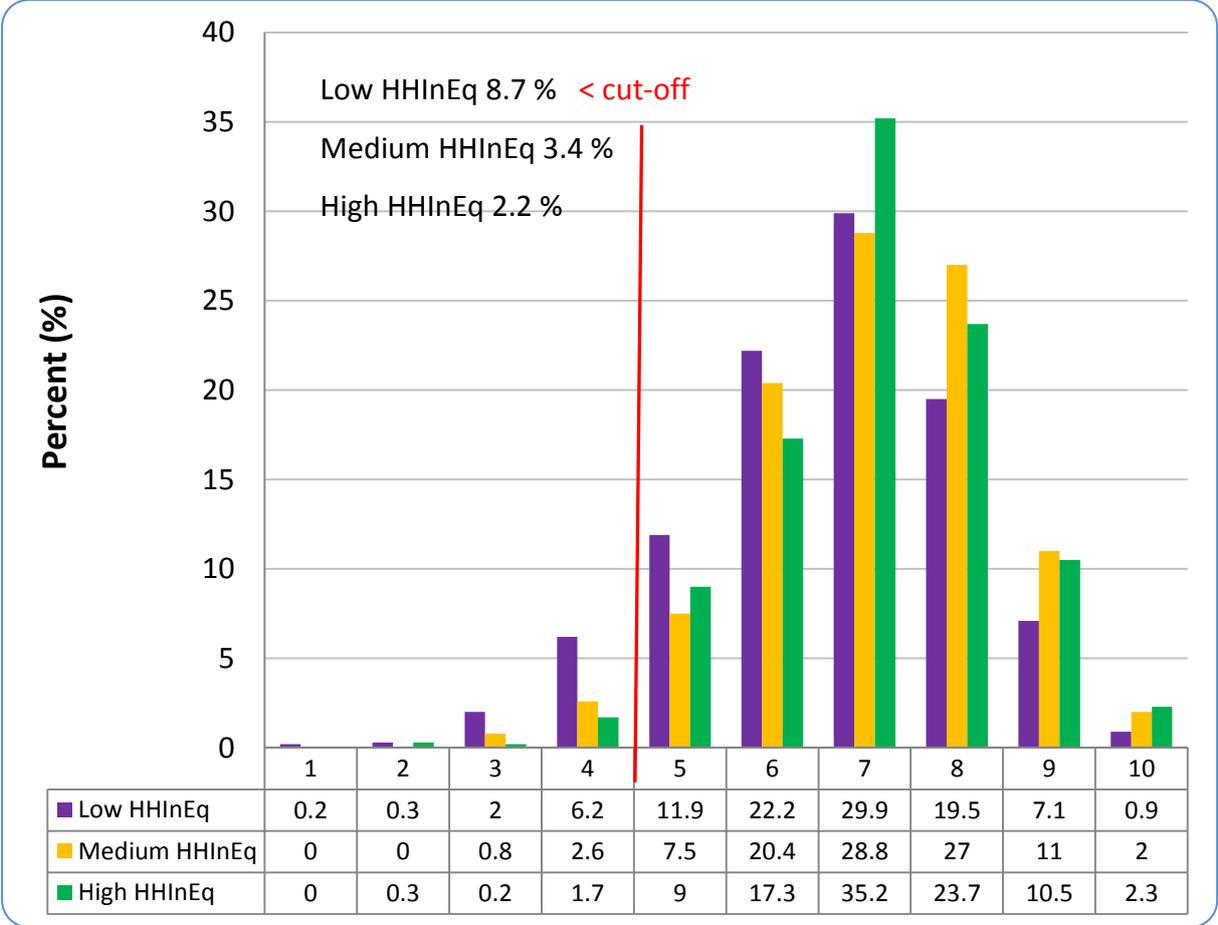


Figure 6. MDD-W distribution according to HHInEq levels

The differences on consumption of nutrient-rich food were small across the different levels of HHInEq, with the lowest consumption reported by women with low HHInEq. Figure 7 shows that women with higher HHInEq consumed more eggs, nuts and seeds and vitamin A-rich fruits and vegetables. It seems that HHInEq is a determinant for the likelihood of consumption of these nutrient-rich foods. The low consumption of nutrient-dense foods may have detrimental effect on the micronutrient adequacy of Tajik women with low income.



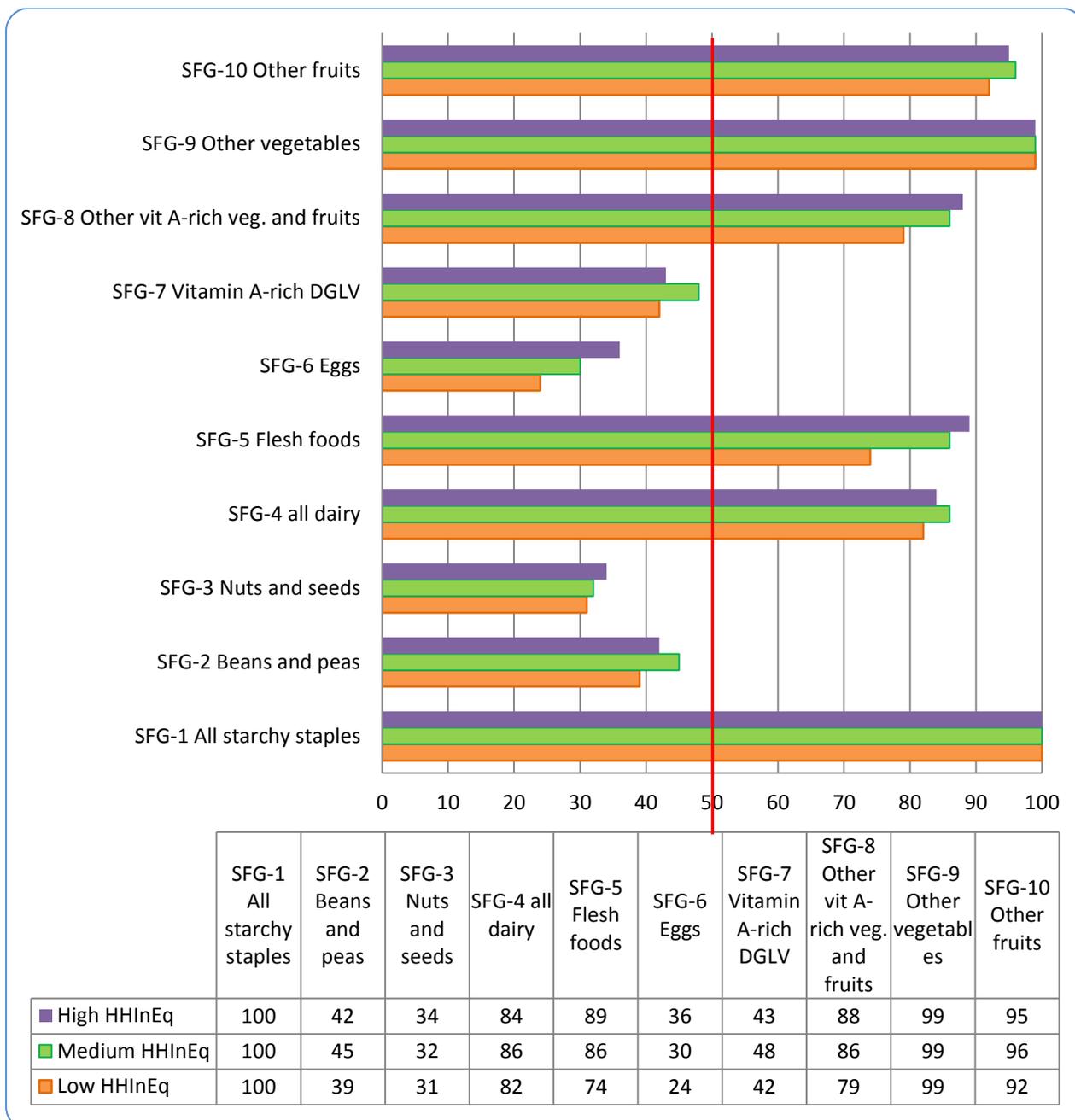


Figure 7. Percentage of women that consumed every food group divided by the Household Income Equivalent (HHInEq)

Rural/urban living area effect on MDD-W score and consumption of nutrient-rich food groups

MDD-W scores and consumption of the food groups were also investigated according to rural/urban areas, the overall sample was divided according to living areas and resulted in two unevenly distributed groups with 1256 women (62%) in rural areas and 773 women (38%) in urban areas. Figure 8 shows more women (5.8%) in the rural

areas had problems reaching the MDD-W when compared with their peers living in urban areas, where only 2.6% of women did not meet the MDD-W.

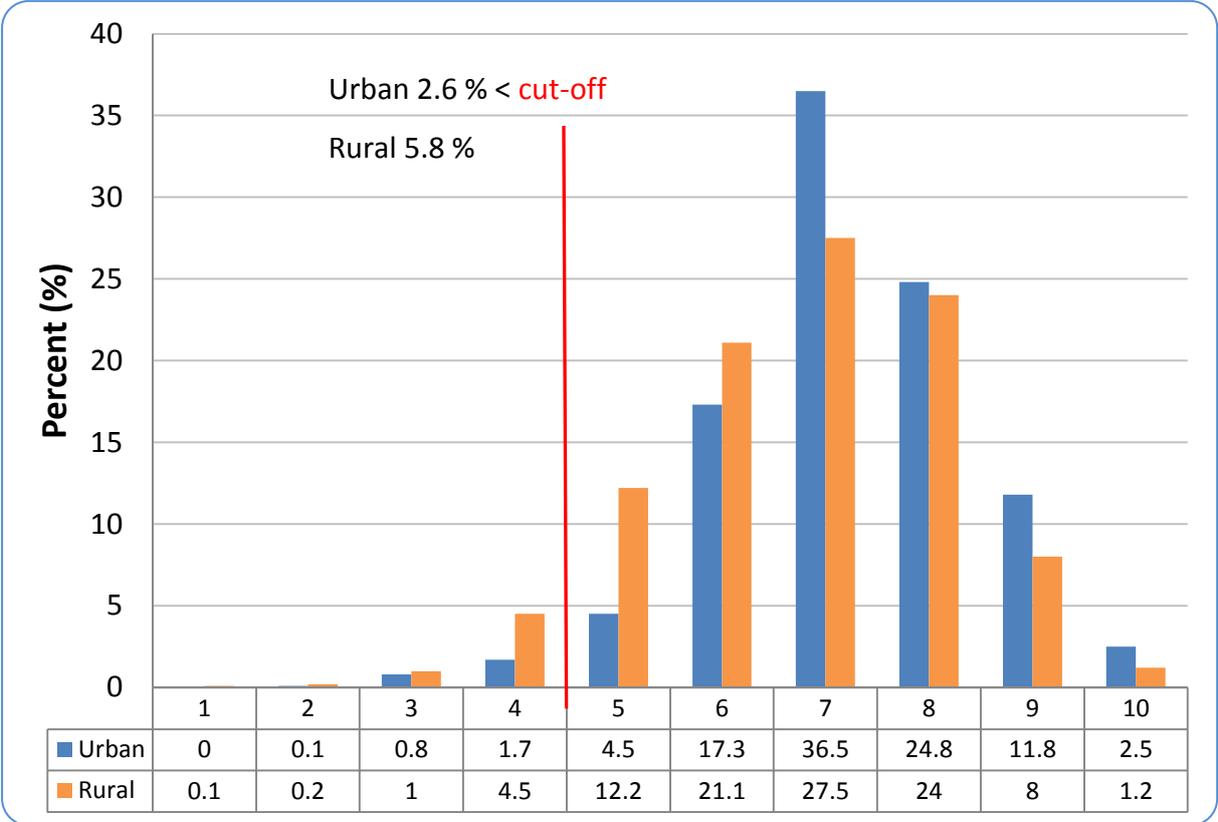
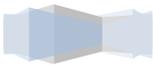


Figure 8. MDD-W distribution according to rural/urban area

Furthermore, Figure 9 shows that most of the food groups were consumed by a significantly lower number of women living in rural areas compared with women in urban areas, except for the group of DGLV, which was shown to be consumed by more women in rural areas. One reason for the higher consumption of other DGLV in rural areas may be due to the existence of more home gardens and thus higher availability and easy access to DGLV. The consumption of nuts, flesh foods, eggs and flesh foods was higher in women in urban areas; this is in agreement with the data of higher HHInEq. The results indicated that women living in urban areas, with higher household income are more likely to consume these nutrient-rich foods, thus they are more likely to achieve micronutrients adequacy.



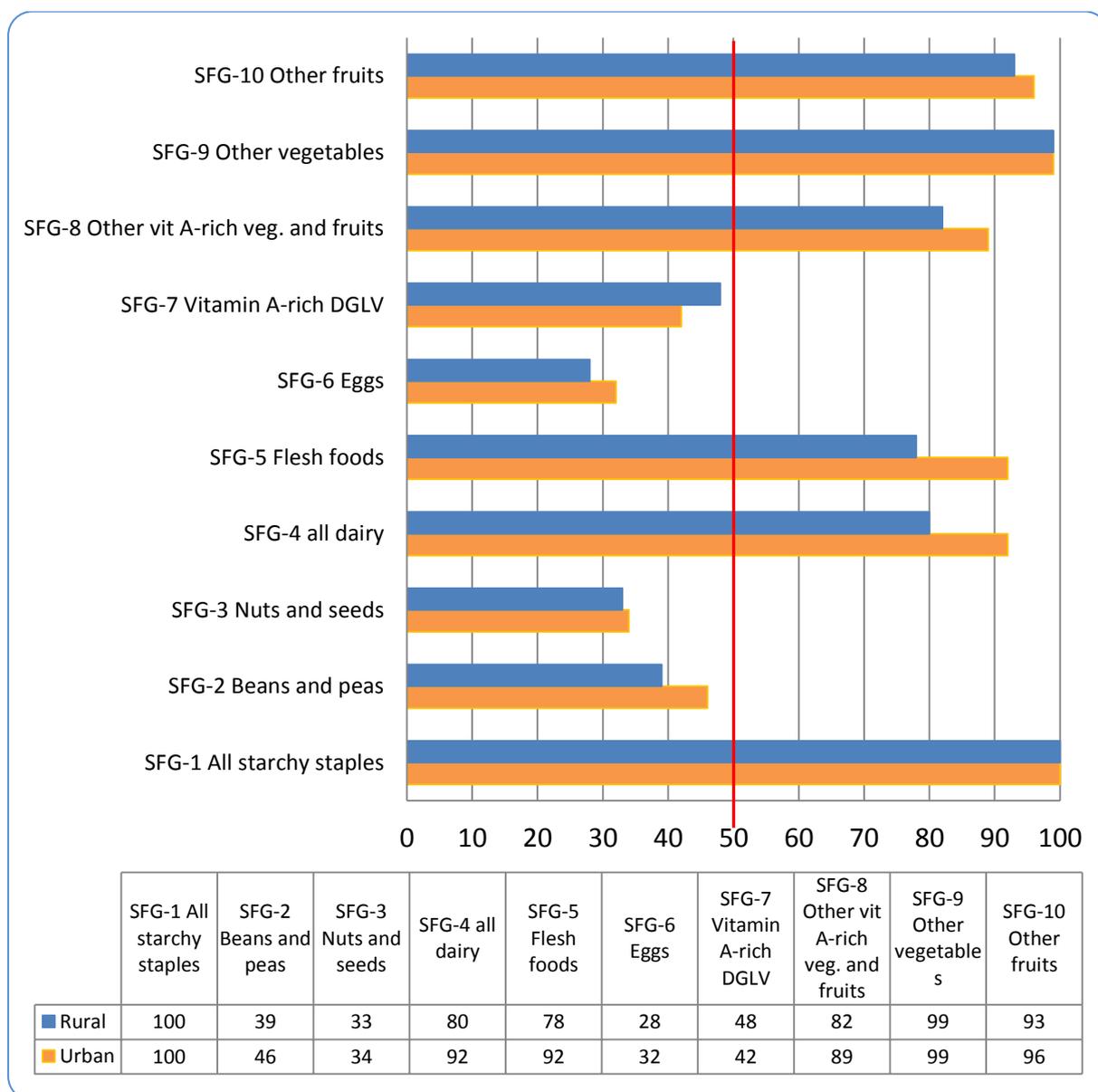


Figure 9. Percentage of women that consumed every food group divided by rural/urban areas of residence

Associations between the significant determinants (HHInEq and rural/urban) in the different regions in Tajikistan are shown in Table 10. A higher MDD-W score of 8 was found in RRS, while the MDD-W scores in the other regions were 7. In addition, in the regions of RRS, Khatlon and GBAO it was found that the majority of the women (from 73% to 80%) were from rural areas, conversely in Dushanbe none of the women was from rural areas.



Table 10. Socio-economic and demographic factors associated with MDD-W score in the different regions

Region	MDD-W		HHIEq (Somoni)		Rural area	Poverty rate [†]
	Median	P (25 th , 75 th)*	Mean	SD	n (%)	%
Tajikistan	7.00	6.00, 8.00	1032	1058	1256 (62)	32.0
Dushanbe (n=265)	7.0	7.0, 8.0	1077	1106	0 (0)	19.9
Sughd (n=567)	7.0	6.0, 8.0	963	1509	349 (62)	23.1
Khatlon (n=599)	7.0	5.0, 8.0	779	476	439 (73.3)	37.7
RRS (n=400)	8.0	7.0, 8.0	733	328	320 (80)	37.8
GBAO (n=198)	7.0	6.0, 8.0	959	898	148 (75)	37.3
Chi Square (P value)			35.2 (<0.001)		11.8 (0.001)	

MDD-W, Minimum Dietary Diversity-Women. **HHIEq**, Household Income Equivalent

*P(25th, 75th), 25th and 75th percentiles.

[†] Poverty rate, data published in 2015 by AoS⁽³⁾

The results could also be associated with the poverty rate in each region. Table 10, shows the poverty rate in the different regions, which was reported by AoS in 2015 ⁽³⁾ Higher poverty rates were found in GBAO (37.3%) and RRS (37.8%) compared with the rates found in Sughd (23.1) and Dushanbe (19.9) ⁽³⁾. The results of MDD-W, HHIEq and rural/urban reported in the pilot studies ⁽²⁰⁾ were in agreement with the previously published results of poverty rate. However, in the present data collection, it was surprising that RRS region having the highest poverty rate (37.8%), one of the lowest HHInEq (733 Somoni/month) and the highest percentage of women from rural areas (80%), reported the highest MDD-W score of 8. It is recommended that in future, evaluations of poverty rate, food availability and food security (which could be calculated from the HBS interviews), should be investigated together with MDD-W. Therefore, a joint statistical analysis could provide valuable information regarding how the MDD-W in women of reproductive age is affected by household food security, food access and poverty rate.



The outputs of the implementation of an M&E mechanism are presented in the final report titled 'Improvement of Quality Control and Monitoring and Evaluation Mechanism on Nationwide MDD-W data collection', which is provided in Annex 7.

- M&E Committee was formed, the Committee held a meeting to discuss and agreed upon M&E activities, indicators, targets, means of verification and corrective actions. The M&E Committee consists of the following members:
 - Shokirzoda Sh. First Deputy Director, AoS;
 - Qulov A., Head of Demography, Employment and statistics Department, AoS;
 - Sharipova B., Specialist, AoS;
 - Rakhmatullaev Sh. Chief of MCH Department, Ministry of Health;
 - Kurbanov S., National Consultant, FAO;
 - Sadykova U., National Consultant, FAO;
 - Ashurov J, Khatlon Region, AoS
 - Abdulloev N, Sugd Region AoS,

- The M&E Committee discussed the challenges and difficulties faced during the field work during the nationwide MDD-W data collection:
 - Wherever women of reproductive age were not found, enumerators had to look for other households (within HBS), which added a workload.
 - Very often women were not at home (working) and enumerators had to come back to interview them.
 - Families which were used to HBS couldn't understand why additional data collected on women now (household questionnaire vs. individual questionnaire)

- The measured indicators with their respective means of verification were agreed upon and are presented in Table 11.



Table 11. M&E indicators, targets and actual measurement

Indicator	Agreed %	Actual %
Number of enumerators training (collected by M&E supervisors)	50	67
Number of households selected	2000	2040
Number of households where spot checking has occurred (cross-reference with true data collected by M&E supervisor through cross checking)	50%	50%
Number of incomplete questionnaires	10%	0%
Number of correctly filled questionnaires	90%	98%
Number of visited households	100%	102%
Number of households where there was no woman of reproductive age	2-3%	4,6 %
Number of households where information on two women was collected	2-3%	0,2 %
Number of women interviewed from households not on the original list of households to be visited	2-3%	2%
Number of households who have MDD-W data included in the HBS	2000	2000

Recommendations provided by the M&E committee:

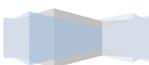
- ✓ Continue M&E and quality control activities as they proved to be very informative and useful for successful project implementation. All M&E related development and progress should be well documented.
- ✓ Conduct further M&E activities in next data collection period and to see the dynamics of percentages related to each indicator.
- ✓ Ensure secured funding for M&E activities, especially at the regional and district levels.



- ✓ Include Ministry of Health representatives into monitoring teams, their travel expenses should be considered accordingly.
- ✓ Funding of data entry specialists and local consultants should be considered;
- ✓ In 2017, data collection should be conducted during two seasons (harvest and non-harvest seasons). This information is going to provide dietary diversity patterns during two seasons.
- ✓ In questionnaire, in addition to place of work, occupation of woman should be included.
- ✓ The results of monitoring and evaluation activities will be circulated among respective AoS staff (including those involved & interested in HBS).

5 Summary of key findings obtained in the nationwide MDD-W data collection

- HBS and MDD-W data were collected from a total of 2029 women (32 ± 9 years) across the country: 265 women in Dushanbe, 567 in Sughd, 599 in Khatlon, 400 in GBAO and 198 in RRS. The overall sample consists of 62% of women from rural areas and 38% from urban areas.
- The MDD-W median and 25th-75th percentiles in Tajikistan was 7 (6 – 8). Similar MDD-W scores were found in Dushanbe, Sughd, Khatlon and GBAO. In RRS the MDD-W was as high as 8 (7 - 8).
- The interviewed women reported a relatively high MDD-W, about 95% of the overall sample have reached the minimum dietary diversity with MDD-W equal or above the cut-off of 5. The percentage of women that met a minimum dietary diversity with the probability of having an adequate nutrient intake was 98.9% in Sughd, 98.1% in Dushanbe, 95.5% in GBAO and 93.3% in RRS and 90% in Khatlon. However, it is necessary to bear in mind that data collection took place during the harvest season. The results could be different if data are collected in lean season.
- RRS region had shown to have a good MDD-W with consumption of most of the food groups by more than 50% of the women, except for the consumption of eggs which was somehow lower in RRS. Only 8% of the women in RRS consumed eggs, compared to 50% in Dushanbe, 39% in GBAO, 28% in Sughd and 24% in Khatlon.
- The following food groups were consumed by more than 50% of the women in each region: starchy staples were consumed by 100% of women in all regions, other vegetables and other fruits were consumed by more than 90% of the



women. Meat, flesh foods and dairy products were consumed from 70 to 99% of the women.

- Conversely the following food groups were consumed by less than 50% of the women: eggs, nuts and seeds (except in RRS) and beans and peas (except in RRS). Therefore, there is a potential of improving the MDD-W score in this population by encouraging the consumption of food items in these food groups.
- Household income and rural/urban areas were significantly associated with having a higher MDD-W score and with the consumption of nutrient-dense foods. Women with higher incomes and living in urban areas had higher MDD-W scores, as well as a higher percentage of women with these characteristics reported the consumption of flesh foods, eggs and nuts compared with women with lower household income and living in rural areas.

6 Conclusions

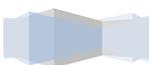
- In conclusion, the nutrition module MDD-W was successfully integrated into the national HBS in Tajikistan. Nationwide MDD-W data collection, analysis and reported were conducted along with the implementation of an M&E framework to ensure that the MDD-W collected data are of high quality. The MDD-W module has been integrated into the HBS for strengthening Tajikistan's food security and nutrition information system in the framework of the EU-FAO project "*Improved Global Governance for Hunger Reduction*". The following are highlights of the project:
- The project is highly relevant as it may contribute to strengthening food security and nutrition information systems in Tajikistan. The findings on socioeconomic and demographic factors affecting women's dietary diversity and consumption of nutrient-rich food groups would encourage and inspire policy makers to plan and implement national initiatives to improve the food security and nutrition environment for the people in Tajikistan.
- The process of integrating MDD-W into the HBS in Tajikistan already informed decision-makers in the Minister of Health and Social Protection on the importance of diversified diets and thus the Ministry decided to include the MDD-W indicator into Goal no. 3 of the country's Sustainable Development Strategy (2016-2030).



- Capacity of AoS enumerators and trainers was developed on the collection of dietary data, MDD-W data analysis and the implementation of an M&E framework to ensure that MDD-W collected data are of high quality.
- The MDD-W questionnaires were adapted to the local context for its application at national level in each region of Tajikistan: Sughd, Dushanbe, Khatlon, RRS and GBAO regions. The MDD-W questionnaire include local food habits and common food names.
- As a final phase of the integration process the nationwide MDD-W data collection was conducted in 2016, where MDD-W data was successfully collected in urban and rural areas in the five regions of the country. MDD-W collected data was useful to:
 - Evaluate dietary diversity of women and to identify the percentage of women that did not meet the minimum dietary diversity;
 - Evaluate the consumption of specific food groups. For example, identify the most and least consumed food groups, and the percentage of women that consumed nutrient-dense foods;
 - Provide an indication of micronutrient adequacies (i.e. vitamin A and iron);
 - Allow for monitoring dietary diversity and consumption of specific food groups over time and in different urban/rural settings;
 - Provide joint statistical analysis on household income and other characteristics collected on the HBS and MDD-W results, in order to investigate the associations of socio-economic and demographic variables and the dietary diversity of women.
- The MDD-W to collect dietary data within the framework of the national HBS in Tajikistan has the following advantages that may encourage other countries to follow this initiative:
 - It comprises a large sample size, which represents the national population;
 - Regular data updating ensures sustainability of data collection while strengthening national capacities;



- Data collection is cost-effective, as regular data collection for HBS is already in place.
- MDD-W presents some advantages compared with traditional dietary assessment methods such as the short amount of time needed for data collection and analysis, as well as simple and less expensive implementation. Thus, low technical capacity in nutrition and limited budget at the country level should not discourage the use of this proxy assessment indicator. In fact, the project in Tajikistan capitalized on the existing national capacity and equipped the local AoS staff with knowledge on the MDD-W for dietary data collection.
- The cost for the six phases of the project, from implementation to the nationwide MDD-W data collection was approximately USD 27 000. It is expected that further data collection and analysis in the same scale would be less costly, as the tools and methodology have already been developed and enumerators have been trained. Conversely, the cost to set up a traditional food consumption survey is estimated to be much higher than running a MDD-W survey. More detailed dietary assessment (i.e. 24-hour recalls, food frequency questionnaires and food records, etc.) can provide quantitative data on nutrient intake. However, these would require solid nutrition capacity and availability of an updated national food composition table.
- It must be clarified that MDD-W does not report quantitative information of dietary intake. It represents the median dietary diversity of a women's population, however not the individual food consumption, and its value may significantly vary by season. In addition, a randomized selection of the participants is necessary to obtain representative data on dietary diversity at population level. It is also important that an even distribution of subjects between urban and rural areas is maintained, unless the project objectives focused only on one specific settlement area.
- Although MDD-W is a universal tool, it still needs to be adapted to the local context in order to be more comprehensible. Thus, there has to be an agreement on the terminology used in the questionnaire, as well as, in the name of foods, mixed dishes and ingredients contained in every mixed dish.
- MDD-W tool can be applied at a national or local level through integration into the existing HBS model, and can be easily adapted for use in either urban or rural areas. The tool is useful for national nutrition surveillance, to assess baselines and to track the nutrition impact of food and nutrition interventions.



7 Recommendations

- ✓ Nationwide data collection in lean season or a season of limited food availability is recommended to evaluate the dietary diversity during other seasons of the year in order to identify seasonal variation in dietary diversity. It should be borne in mind that in the present project data were collected during the harvest season, hence high MDD-W scores were obtained.
- ✓ The government of Tajikistan is encouraged to regularly collect MDD-W data at national level and representative of seasonality, geographic locality and socio-economic groups. The findings of such data collection would help to:
 - Identify regions and population groups at high risk of inadequate dietary diversity and micronutrient inadequacy;
 - Provide invaluable national representative data for policy and decision making by the government.
- ✓ According to the nutrition information needed, different options for MDD-W data collection can be considered:
 - Target specific regions or districts at risk of high levels of malnutrition/micronutrient deficiencies;
 - Remote/isolated areas that might present specific nutrition problems;
 - Compare rural/urban areas across different regions in the country;
 - Nationwide implementation, once per year, for monitoring of dietary diversity and evaluation purposes.
- ✓ Furthermore, taking into consideration seasonality, geographic distribution and socio-economic groups would make it possible to obtain invaluable food security and nutrition information for identifying nutritional targets and devising programmes to improve food security and nutrition in Tajikistan. Future work could also look into the relationships between dietary diversity score and indicators of nutritional status.
- ✓ HBS is a sustainable survey conducted in Tajikistan on a regular basis. In this regard and based on the results of the nationwide data collection in 2016, the Ministry of Health will consider the practicability of definitively integrating the MDD-W module into the HBS and request AoS to conduct MDD-W data collection regularly.



- ✓ It is also recommended to continue M&E and quality control activities as they proved to be very informative and useful for successful project implementation and they are critical to ensure that MDD-W collected data are of high quality. All M&E related development and progress should be well documented and revised for improvement.

8 References

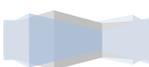
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Annex 1

MDD-W questionnaire used for data collection in Tajikistan

Statistics Agency under the President of Tajikistan
Household Budget Survey - Add to Form 2

Household No (from HBS):

--	--	--	--	--	--	--	--

Minimum Dietary Diversity-Women

MDD-W Code:

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Name of the enumerator:	
Date of interview: (dd/mm/yyyy)	

Part 1 – Demographic information of interviewee,
Please fill in the blank and tick the appropriate boxes.

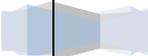
Part 2 – 24-hour dietary recall

Question	Answer	Code for entry (if applicable)
Name of interviewee		
Date of Birth (dd/mm/yyyy)	D D M M Y Y Y Y	
Age		
Occupation		
Number of Children		
Sex	Male <input type="checkbox"/>	0
	Female <input type="checkbox"/>	1
Marital Status	Single <input type="checkbox"/>	0
	Married <input type="checkbox"/>	1
	Divorced <input type="checkbox"/>	2
	Widow <input type="checkbox"/>	3
Education level	No Education <input type="checkbox"/>	0
	Primary School (1-4) <input type="checkbox"/>	1
	Secondary School (5-9) <input type="checkbox"/>	2
	Secondary School (10-11) <input type="checkbox"/>	3
	Middle- level Education (college) <input type="checkbox"/>	4
Pregnant	No <input type="checkbox"/>	0
	Yes <input type="checkbox"/>	1
Lactation	No <input type="checkbox"/>	0
	Yes <input type="checkbox"/>	1
Responsible for food preparation	No <input type="checkbox"/>	0
	Yes <input type="checkbox"/>	1
	Partial <input type="checkbox"/>	2
Living area	Rural <input type="checkbox"/>	0
	Urban <input type="checkbox"/>	1

Please describe the foods (meal/ tea break/ shirini) that you ate or drank yesterday, whether at home or outside the home. Start with the first food or drink of the morning. Write down all foods and drinks mentioned. When composite dishes are mentioned, ask for the *FULL* list of ingredients.

When the respondent has finished, probe for meal/ tea break/ shirini not mentioned

Time:	Meal/ Tea break/ Shirini:
Time:	Meal/ Tea break/ Shirini:
Time:	Meal/ Tea break/ Shirini:
Time:	Meal/ Tea break/ Shirini:
Time:	Meal/ Tea break/ Shirini:
Time:	Meal/ Tea break/ Shirini:



Part 3 – Table of Food Groups

After the respondent recalls all the food and beverages consumed, underline the corresponding foods in the list under the appropriate food group. For any food groups not mentioned, ask the respondent if a food item from this group was consumed. Write '1' in the column next to the food group if at least one food in this group has been underlined. If the food is not listed in any group, write it in the remark page (p.4) and discuss it with the supervisor.

Question Number	Food group	Locally available foods	Yes=1 No=0
1	Cereals	Wheat, barley [perlofca], buckwheat, oats, maize, rice, sorghum, pasta, wheat bread, rye and other bread, wheat flour, other flour, pasta products, kirieshki (snack made from flour), pop corn	
2	White roots and tubers	Potato, turnip (yellow, white), radish (red,green)	
3	Vitamin A rich vegetables and tubers	Pumpkin, carrot, red sweet pepper (bulgori), squash	
4	Dark green leafy vegetables (DGLV)	- Spinach, rhubarb, siyoalaf, bargi salat; - dill, coriander, mint, parsley, blue basilica, green garlic, green onion, sorrel, celery, grape leaves, jagh-jagh [Consider as DGLV when consumed at least one table spoon of these vegetable(s) per day. Otherwise, go to Group 16]	
5	Other vegetables	Cabbage, cauliflower, garlic, cucumber, leek, tomato, onion, eggplant, beetroot, mushrooms fresh and dried, anzur , green beans, green pepper	
6	Vitamin A rich fruits	Apricot [quoq] and dried apricot, peach and dried peach, Persimmon	
7	Other fruits	Apple, banana, lemon, watermelon, mandarin, grapes, pears, melon, muskmelon, fruits and berries, dried fruits and berries, raisins, oranges, cherries, figs, plum, pomegranate, prune, quince, raspberries, strawberries, blackberries, mulberries, king mulberries, yellow cherry, plum (orange-color), sinjid, chelon, dulona, kiwi, pineapple, grapefruit, simorodina, green apricot, hips	
8	Flesh foods and organ meat	Beef, mutton, goat, chukar, rabbit, chicken, goose, turkey, quail, sausages, veal, lamb and chevron, meat of wild animals and games, sausage products and smoked meat, horse, duck, ox tail, liver, kidney, heart, lung, stomach, intestine,tongue, brain (goat and Sheep), spleen [saburs] (cow, goat and sheep), pustdumba (skin of button sheep)	
9	Eggs	Quail eggs, chicken eggs, goose eggs, turkey eggs, duck eggs	
10	Fish and sea foods	Fresh and frozen fish, canned fish, smoked fish, dried fish, caviar, crab sticks	
11	Beans and peas	Mung bean, peas, red beans, white beans, lentils, chickpeas	
12	Nuts and seeds	Sesame seed, pistachios, almonds, pumpkin seeds, sunflower seeds, walnuts, peanuts, apricot seeds, hazelnut, pecan	



Question Number	Food group	Locally available foods	Yes=1 No=0
13	Milk and milk products	Milk, skim milk, sour milk, yogurt, qurut (dried yogurt), ice-cream, kefir, chaka, kaymak (sour cream), cheese, sour cream/smetana, powdered milk, condensed milk, tvorog, falla (colostrum from cow), goat milk	
14	Oils and fats	Vegetable oil (sunflower, flax, sesame, cotton, olive), butter, sheep fat, margarine, mayonnaise, ravgani zard (oil prepared from kaimak and butter), mahsar/saflo oil (plant oil), mixed oil (animal fat and vegetable oil), turta (sediment of boiled kaymak), potato chips	
15	Sweets	Sugar, honey, candies, chocolate, cakes, biscuits, jam, halva, baklava, obinabot (crystalised sugar), nishollo, shirini tut (Tajik snicker, mulberry paste with sugar), pechak	
16	Spices, condiments, beverages	<ul style="list-style-type: none"> - black pepper, cumin, ketchup, salt, pripava (adviya), chicken/ beef cubes; balsamic vinager, vinager; - dill, coriander, mint, parsley, blue basilica, green garlic, green onion, sorrel, rosemary (small green leaves), black sesame seeds, bay leaf. [Consider as condiments when these vegetable(s) are consumed less than one table spoon a day. Otherwise, go to Group 4]; - coffee, black and green tea, khuch, fruit drinks (compote), sweet soda, water 	

Remarks:



Food and Agriculture
Organization of the
United Nations



Annex 2

Aggregation of food groups to calculate MDD-W score

Question number(s)	The 10 Food groups	Score
1,2	All starchy staples	
11	Beans and peas	
12	Nuts and seeds	
13	All dairy	
8, 10	Flesh foods (including organ meat and miscellaneous small protein)	
9	Eggs	
4	Vitamin A-rich dark green leafy vegetables	
3, 6	Other vitamin A-rich vegetables and fruits	
5	Other vegetables	
7	Other fruits	
MDD-W (sum of the above scores)		



Annex 3

List of most consumed dishes classified by meals Tajikistan

	A. Breakfast	Ingredients
1	Black and green tea	Tea, sugar, honey
2	Boiled eggs and sausages (boiled/ fried)	Egg, oil, beef, chicken, soy bean, onion, greens, ketchup
3	Bread	Wheat flour, salt, variation: butter
4	Butter or margarine	Cow milk, maska
5	Chalpak	Wheat flour, oil, salt, greens, onion
6	Fried potatoes/ boiled potato	Oil, potatos, onion, variation: beef
7	Havloi tar	Wheat flour, sugar, oil, water/milk
8	Jam/murabbo	Fruits, sugar, water
9	Kefir/Yogurt/Qatiq	Kefir/Yogurt/Qatiq
10	Mannaya kasha	Semolina, milk, sugar, butter
11	Oshi omuch	Locally made wheat starch, milk, yellow oil or butter
12	Omelets	Egg, wheat flour, greens, oil
13	Orzuq	Wheat flour, oil, salt, milk, egg
14	Otala	Fried wheat flour with oil, milk, salt, water
15	Pancakes	Egg, wheat flour, egg, milk, oil, sugar
16	Kaymak	Kaymak (cream)
17	Shirbirinj	Milk, rice, salt, butter, water
18	Shirchoy	Tea, milk, salt, sometimes wallnuts are added,
19	Shirkadu	Pumpkin boiled into milk, salt, sugar
20	Shirravaghum	Milk, oil (maska), sometimes Kaimak is added
21	Smetana	Smetana (sour cream)
22	Quymog	Wheat flour, water, vegetable oil, chicken, egg
	B. Lunch/ Dinner	Ingredients
1	Borsh	Beetroots, cabbage, beef meat, onion, carrot, potato, tomato
2	Bread	Wheat flour
3	Damlama	Cabbage, carrot, potato, meat (beef or lamb), onion, oil, greens, chickpeas, garlic
4	Fatir	Wheat flour bread containing oil
5	Fruits	Apple, pear, peach, cherry, plump, pomegranate, grape, mandarin, kiwi, banana
6	Goluptsi	Sweet pepper (or cabbage), minced beef/mutton meet, onion, rice, grape leaves, oil, salt, water, condiments
7	Greens	Parsley, coriander, dill, sorrel, spring onions
8	Gushtbiryon	Fried meat (beef or lamb or goat) , onio, oil, condiments
9	Kadubiryon	Fried pumpkin, onion, oil, salt, sugar

10	Kalla pocha	Intestines, stomachs, leg, head of lamb, chickpeas, onion, greens all boiled, condiments
11	Kefir/Yogurt	Kefir/Yogurt
12	Kotlet	Minced meat (beef), onion, dried bread, oil
13	Lagman	Homemade noodles, oil, meat, vegetables, potatoes, herbs
14	Makaron plov /pasta plov	Oil, macaroni, meat, carrot, onion, tomato
15	Mantu	Wheat flour to make a steamed dough, meat (or pumpkin), onion, oil, local variation: potatoes
16	Mastova	Rice, oil, carrot, potato, meat, tomato, peppers, chickpeas, greens, sometime chakka is added
17	Moshkichiri	Mung beans, beans, oil, rice, carrot, onion, salt
18	Non-plov/ bread plov	Dried bread, onion, carrots, oil, potato, local variation: eggs
19	Okroshka	Cucumber, kefir, dill, mashed meat or sausage, egg, greens, radish
20	Fatir	Wheat flour, butter/ravgani zard
21	Fatir maska	Wheat flour (fatir), butter, milk
22	Plov/ osh	Rice, beef or mutton, chickpeas, carrots, onion, oil, condiment: cumin, hot pepper powder, dill, parsley, coriander, blackberries
23	Qalama	Wheat flour (dough), oil, eggs, sugar, sour cream
24	Qurutob	Small pieces of fatir (crashed wheat bread) hot water, yoghurt and cucumber, tomato, onion, oil, green vegetables and meat
25	Rasolnik	Meat, oat, cucumbers, carrot, oil, potato, greens
26	Sambusa	Wheat flour to dough, meat, onion, oil, cooked in the traditional oven-tandoori or oven, local variation: greens, lagh-lagh
27	Shakarob	Tomatoes, cucumber, onions, oil, herbs, greens
28	Shashlik	Grilled meat (beef, lamb, chicken, turkey, liver) and condiments
29	Shavla	Onion, carrot, small pieces of meat, water, oil, and can be prepared without meat
30	Shurbo	Meat (beef/lamb), carrots, potatoes, oil, onion, herbs, variations: peas, chickpeas, tomato, sweet pepper
31	Tea	Tea, black or green, sugar, honey
32	Tuppa	Wheat flour to make boiled dough cut in small pieces, vegetables served with boiled vegetables (beans, peas, coriander), onion, tomato, carrot, yellow turnip. Yogurt can be added before eating
33	Tushbera/pelmeni:	Noodle dough filled with meat in soup, tomato, onion, oil

34	Ugro:	Wheat flour, oil, onion, chickpeas and greens, wheat noodles, meat, tomato, carrot, potato, yellow turnip, mugbeans
35	pickles	Pickles (cucumber, tomatoes)
36	Moshgurunj/Moshshula	Mug beans, rice, onion, carrot, potato, meat, tomato, oil
3. Snack/ tea break (Shirini/ Advia)		Ingredients
1	Biscuits	Biscuits
2	Bread	Bread
3	Cakes	Cakes
4	Chakchak	Fried dough with eggs and sugar/honey
5	Chocolate	Chocolate
6	Cookies	Cookies
7	Dried fruits	Dried fruits
8	Jam	Jam
9	Kefir	Kefir
10	Pickles	Pickles
11	Tajik Snicker	Mashed mulberry with sugar
12	Toast/ Dried bread	Toast/ Dried bread
13	Nuts, pistachio, almonds, sunflower/pumpkin seeds	Nuts, pistachio, almonds, sunflower/pumpkin seeds
14	Halvoitar	Wheat flour, sugar, milk or water, walnuts
15	Chocolate	Chocolate
16	Dried mulberry	Dried mulberry
17	Nishollo	Delicacy from sugar and whipped egg
18	Potato chips	Potato, oil, salt
19	Pop corn	Corn, oil, sugar, variation: sugar



Annex 4

Instructions for administering MDD-W questionnaire

1. Introduce yourself and explain the purpose of the interview clearly in layman language.
2. Fill in the MDD-W Code and demographic information, make sure all items are filled in correctly (call out the answer to the respondent)
3. Ask the respondent if the previous day was a usual/typical day in terms of their food intake. Ask if they consumed more or less than usual. If the previous day's intake was usual then continue with the questionnaire.
4. Explain to the respondent that you are going to ask her a series of questions about the foods and drinks that she consumed the previous day or the last 24-hour. The 24-hour cycle lasted from the time she got up in the morning yesterday until at the time she got up in the morning today. It doesn't matter that the recall period spans over two calendar days. Both inside and outside home food consumption are counted. Tell the respondent that there are no correct or incorrect answers.
5. If the respondent is the one who is responsible for cooking in the family, remind her that you are going to ask about the diet that she actually consumed but not the diets of her family.
6. Ask the respondent to think back to yesterday, to the time she woke up in the morning. Ask her to tell you the first thing she ate or drank – record this in the free recall space. For the Tajik eating habits, the first foods eaten in the morning are usually at breakfast. You should also ascertain if she ate or drank anything in between the time she got up in the morning and the breakfast.
7. Continue asking “after breakfast, when was the next meal, food, or drink she consumed?” And record everything including water in the open space. Continue through the entire day until the respondent went to bed. Be cautious that some women might eat or drink at night, e.g. Lactating mothers breastfeed infants at night. Use local names for meal occasions such as breakfast, lunch, dinner, meal, tea and shirini. Record these items in the space provided in the questionnaire.
8. Probe for food, drinks, tea and shirini eaten between the three main meals with the respondent. Probe for added foods such as sugar in tea, jam in bread, oil in mixed dishes or greens in soups and salads.
9. For any mixed dishes (e.g. plov, shurbo or mantu) record each ingredient in the free recall space. Please refer to the recipes in the document “List of common mixed dishes classified by meals” have been underlined in the food group.
10. Apply the minimum quantity rule, **excluding** food groups that contain quantity less than 15g per day (but not per meal) (15g is roughly about one tablespoon). Except for salt, spices and condiments in group 16.
11. After the respondent recalls all the foods and drinks consumed, start underlining the corresponding foods items listed in the appropriate food groups. Underline food items



in the food groups meal by meal in chronological order in order to avoid confusion. For foods or dishes not listed in any food group, write it in the “Remark” column on the questionnaire and discuss with the supervisor.

12. Write “1” in the column next to the food group if at least one food in this group has been underlined. Do not write “0” in the column next to the food group at this stage if no food items have been underlined in the food group.
13. Continue to probe for food groups where no food was underlined. It is not necessary to read out to the respondent the exact name of the food group, but simply ask (for example) about fruits, vegetables or tubers if these groups were not previously reported. Write “0” in the column next to the food group when it is certain that no foods in that group were eaten.
14. For foods with unknown ingredients; write down the name of the food in the “Remarks” section at the end of the questionnaire. Ask the respondent to check the ingredients from the person who prepared the foods and get back to you later. Alternatively if the food was bought from the market, go and check the ingredients from the shop in the market.



Annex 5

Frequently asked questions and answers for MDD-W assessment

1. How many enumerators should be present at the household to undertake MDD-W interview with the respondent?

No more than 2 enumerators should be present in the household; otherwise, the respondent would feel uncomfortable, in particular among women, and she might refuse to be interviewed.

2. What is the target group in the household for MDD-W data collection?

The target individuals in the household are women at reproductive age, i.e. 15-49 years old. It is desirable to interview the woman who prepares foods for the family if there is more than one woman meeting the criteria in the same household.

3. If the target woman in the household is not available or if the previous 24-hour was not a usual/ typical day, what should we do?

Only one woman meeting the selection criteria should be interviewed. The enumerator should make a future appointment to visit the target woman again in a few days' time. Alternatively, if there is a woman in the household falling within 15-49 years of age and meeting the selection criteria, the enumerator may consider interviewing this woman as an alternative.

4. What are unusual/ untypical days that the enumerators should not base on which to collect MDD-W information?

- i. Unusual/ untypical days refer to those days in which food habits of the sample population are different from usual days, such as Ramadan, religious ceremonies with feasts and other ceremonies. At the same time, food habits of most people at country, region, district, jamoat or family level are also different from usual days. However, celebrations of birthdays, weddings, family visits, eating out at restaurants, etc. that are customary in Tajikistan should be regarded as usual days.
- ii. Respondents with acute health conditions, such as surgical operations, fasting for medical treatments or diarrhea, etc. should be regarded as unusual days. While respondents with chronic disease conditions such as diabetes, high blood pressure or coronary heart diseases, etc. that need to follow a special diet for life, food recall on those long-term special diets should be regarded as usual days.
- iii. Respondent fast for a few days with religious reasons prior to Ramadan should be regarded as unusual days.

5. Should we consider eating at parent's, friend's or neighbor's places as usual/typical days?



It should be usual days because these events are popular in the Tajik's culture.

6. Shall the enumerator record all foods that the woman prepared for the family including those she did not actually eat?

It is the foods and drink actually consumed by the woman herself should be recorded in the questionnaire. Any foods, drinks or dishes, although prepared by the woman, but were not actually consumed by herself should not be recorded.

7. Shall the enumerator record food or drinks consumed by lactating women after she has gone to bed at night in order to practice breastfeeding?

Yes, any food consumed from the time getting up in the morning during yesterday until the time she got up in the morning as of today, including foods or drinks taken overnight, should be recorded in the questionnaire.

8. Is there any difference between grouping sweet pepper (bulgori) red in color and green in color?

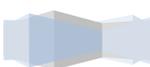
Sweet pepper (bulgori) red in color is high in vitamin A than those with other colors. Red color sweet pepper should be grouped under Group 3 (Vitamin A rich vegetables and tubers), while green and other colors sweet peppers should be grouped under Group 5 (Other vegetables).

9. What about foods or drinks eaten at any time during the day, e.g. nuts, chocolate, fruits and dried fruits or tea?

Enter these item(s) in the space provided for tea breaks/ shirini between main meals corresponding to the time she consumed the food or drink during the day.

10. Shall greens (herbs) be grouped under Group 16 (Spices, condiments, beverages) if any of these greens (herbs) is/are consumed in a large quantity?

Greens or herbs should be entered into Group 4 (Dark green leafy vegetables, DGLV) when the amount consumed is at least one tablespoon per day. If consumption is less than one tablespoon per day, these greens or herbs should be considered as condiments and grouped under Group 16.



Annex 6

M&E framework to ensure that MDD-W data collected are of high quality

Results chain	Indicators		Means of Verification	M&E possible corrective action
	Indicators	Target		
ACTIVITY				
Conduct training of enumerators	Number of enumerators trained (collected by M&E supervisors)			
ACTIVITY				
Select number of household to include into the HBS	Number of household selected (controlled by higher level)			
ACTIVITY				
Conduct fieldwork as planned	Number of households where spot checking has occurred (cross-reference enumerator	50%		



	data with true data collected by M&E supervisor via spot-checking)			
	Number of incomplete questionnaires	Up to 10%	Checking questionnaires submitted by enumerators	
	Number of correctly completed questionnaires	90%	Checking questionnaires submitted by enumerators	
	Number of households visited	100%	List of households visited	
	Number of households visited where the women was no woman	2-3%	Cross-reference list of households visited with main list of HBS households to be visited	
	Number of households where you collected information on 2 women	2-3%	Main list of households visited (look where the same household code appears twice)	



	Number of women interviewed from households not on the original list of households to visit	2-3%	Cross-reference list of households visited with main list of HBS households to be visited	
ACTIVITY				
OUTCOME				
Inclusion of the MDD-W indicator into the Household Budget Survey (HBS) to monitor national nutrition progress	Number of households who have MDD-W data included in the HBS			



IMPACT/GOAL				
To inform effective policy on diets and nutrition of women of reproductive age				



Annex 7

Final Report on Improvement of Quality Control and Monitoring and Evaluation Mechanism on Nationwide MDD-W Data Collection -

by Integrating MDD-W into HBS in Tajikistan, July – August, 2016.

Prepared by

Umeda Sadykova, National Nutrition Consultant, FAO.

This is a final report documenting the nationwide MDD-W data collection and QC-M&E mechanism prepared within the project on **nationwide implementation of MDD-W data collection integrated into the Household Budget Survey (HBS), Tajikistan.**

My specific role and responsibilities related to M&E activities included the following:

- Participation in conference calls and physical meetings with ESN, AoS and other partners on the ground to conduct the MDD-W training courses, data collection and QC-M&E activities;
- Provision of assistance to ESN in planning, preparation and delivering of: three refreshing training courses on MDD-W for enumerators; one training course on MDD-W data analysis and interpretation and training on QC and M&E mechanisms to ensure MDD-W data quality for AoS staff;
- Provision of assistance in implementation of the QC-M&E mechanism to ensure high quality data: M&E questionnaires, conduct spot checks on data collection by enumerators and conduct quality control of filled out MDD-W questionnaires.

The establishment of a Quality Control (QC) and Monitoring and Evaluation (M&E) mechanism was foreseen from the onset of the project. The main purpose of the framework is to ensure that the nutrition module integrated into the Household Budget Survey provides high quality data. The establishment of QC and M&E mechanism was based on the request of Ministry of Health and Agency on Statistics under the President of the Republic of Tajikistan which expressed the need for a nation-wide implementation along a Quality Control (QC) and Monitoring and Evaluation (M&E) mechanism for the MDD-W data collection, so as to provide high quality national representative nutritional data for decision making, and to identify regions and population groups at high risk of malnutrition. The following outputs and activities were specifically related to establishment of quality control and M&E mechanism:

Output 2: The enumerators and staff with experience in MDD-W data collection from AoS in three districts of the country have received refresher training and are capable of undertaking nutrition data collection by using the fully locally adapted MDD-W tool by July 2016.

- Activity 2.3 Develop and agree on monitoring tools and procedures.



Output 4: National wide MDD-W data is collected in selected regions by August 2016.

- Activity 4.5 Quality control (QC) and M&E mechanism are put into place to ensure MDD-W data collection quality.

The following activities were conducted to establish a QC and M&E mechanism:

- one-day training course on MDD-W data analysis, QC and M&E implementation for AoS staff in Dushanbe;
- List of proposed indicators were prepared and presented to AoS leading staff at the national level, and further discussed with AoS representatives at the regional and district levels. Following thorough consultative process and feedback from the regional AoS representatives, proposed indicators were elaborated and finalized.
- Following discussions between FAO HQ and AoS at central level, M&E Committee was established.
- Upon completion of data collection process M&E Committee meeting was held and further recommendation to improve M&E activities were proposed.

M&E Committee consists of the following members:

- Shokirzoda Sh. First Deputy Director, AoS;
- Qulov A., Head of Demography, Employment and statistics Department, AoS;
- Sharipova B., Specialist, AoS;
- Rakhmatullaev Sh. Chief of MCH Department, Ministry of Health;
- Kurbanov S., National Consultant, FAO;
- Sadykova U., National Consultant, FAO;
- Ashurov J, Khatlon Region, AoS
- Abdulloev N, Sugd Region AoS,

Terms of Reference of M&E Committee include:

- Meet regularly to review data collected to ensure that all targets are met;
- Provide with corrective recommendations and adjustments if any inconsistency is observed;
- Provide technical inputs throughout the project implementation;



The following indicators with respective means of verification were agreed upon:

Indicator	Agreed %	Actual %
Number of enumerators training (collected by M&E supervisors)	50	67
Number of households selected	2000	2040
Number of households where spot checking has occurred (cross-reference with true data collected by M&E supervisor through cross checking)	50%	50%
Number of incomplete questionnaires	До 10%	0%
	90%	98%
Number of correctly filled questionnaires		
Number of visited households	100%	102%
	2-3%	4,6 %
Number of households where there was no woman of reproductive age		
Number of households where information on two women was collected	2-3%	0,2 %
Number of women interviewed from households not on the original list of households to be visited	2-3%	2%
Number of households who have MDD-W data included in the HBS	2000	2000

On September 22, 2016 the first M&E Committee meeting was held. All M&E Committee members were present and discussed the following issues:

- What was M&E team (who were members) composition?
- What indicators have been measured so far (how they were measured and how often etc.) and highlight if targets were met or not. What indicators still need to be measured.
- During M&E activities undertaken in the field, what challenges were faced? Any practical observations?
- Are there indicators that should be added or removed? Were targets set appropriately?
- What should be done further with the current results?
- What actions should be undertaken to improve M&E activities (both at the central and field level)?



Challenges and difficulties faced during the field work:

- Wherever women of reproductive age were not found, enumerators had to look for other households (within HBS), which added a workload.
- Very often women were not at home (working) and enumerators had to come back to interview them.
- Families which were used to HBS couldn't understand why additional data collected on women now (household questionnaire vs. individual questionnaire)

M&E Committee came up with the following recommendations and action points:

- Continue QC and M&E activities as they proved to be very informative and useful for successful project implementation. All M&E related development and progress should be well documented.
- Conduct further M&E activities in next data collection period and to see the dynamics of percentages related to each indicator.
- Ensure secured funding for M&E activities, especially at the regional and district levels;
- Include Ministry of Health representatives into monitoring teams, their travel expenses should be considered accordingly.
- Funding of data entry specialists and local consultants should be considered;
- In 2017, data collection should be conducted during two seasons (harvest and non-harvest seasons). This information is going to provide dietary diversity patterns during two seasons.
- In questionnaire, in addition to place of work, occupation of woman should be included.
- The results of monitoring and evaluation activities will be circulated among respective AoS staff (including those involved & interested in HBS).

