

SDVC II Social Impact Studies

Food nutrition, milk consumption and overall dietary diversity of SDVC Family

The study has explored dietary diversity, milk consumption, and perception of nutrition, hand washing and hygiene practices of SDVC project participants of four *upazila* namely *Kaunia*, *Badargonj*, *Shahjadpur* and *Gabtoli* of three districts of Northern part of Bangladesh. For this topic a total 6 FGDs and 12 key informant interviews have conducted with 84 women group members of SDVC project. The group members and DFT center have selected based on length of membership and duration of installment of DFT.

Study location: *Kaunia*: Kaunia Upazila is under Rangpur District, is bounded by Gangachara and Lalmonirhat sadar upazilas on the north, Pirgachha upazila on the south, Rajarhat Upazila on the east, Rangpur Sadar Upazila on the west. Main rivers are Tista and Burail. Agriculture is the main economical root of maximum people of this Upazila.

Badargonj: Badargonj is an Upazila of Rangpur District, it is well known for the production of Shataranchi and bamboo made things. Number of river runs through this Upazila and Bhelakoba, Nandair, Chaprar, Haribhanga beels are main depressions of this area.

Gabtoli: It is an Upazila of Bogra District. Main source of income is agriculture. This Upazila has a number of fisheries, dairies and poultries, it grows Banana, jute, potato and vegetables.

Shahjadpur: Shahjadpur Upazila is an Upazila of Sirajgonj district. Main River is Jamuna and Karotoa. About 48.22% people are landless. The upazila is famous for cotton and weaving. The first national dairy plant has establish in Sirajgong district.

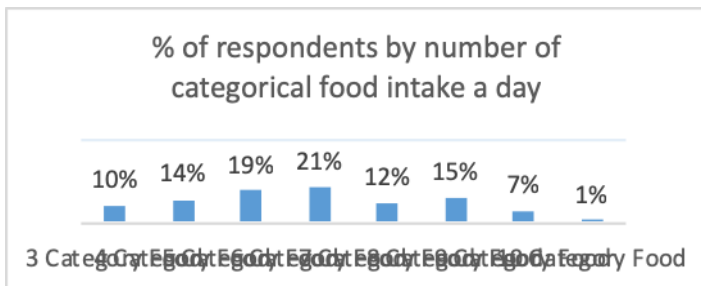
Socio-demographic feature of SDVC producer: The average age of SDVC producer are between 20-45 years and they are mostly married women. The main occupation of the household heads are farming and rearing cow. The average household size is five among study upazila, average household member is less in Gabtoli, its 4.2 and highest is 5.3 in Sahajadpur at Sirajgong district. Majority of the participants only can sign their name and second largest category can read and write, among the respondent only few have completed secondary education.

Dietary diversity and food intake pattern of SDVC family: The study shown that in general food intake in terms of quality and number of meal has improved to a greater extent among the SDVC project participants. Most of the respondents have mentioned that at present they consume more than three times meal with variety of foods compare to last five years. Now most of them eat meat and fish on 4 to 5 times in a month but they ate meat once in a month a few years ago. Now they eat more vegetables round the year. Even those who do not

cultivate vegetables, they also buy vegetables from market. Now a day, they eat more fruits at different seasons, for example in summer they eat more mangoes, litchi and other local variety fruits reported in *Bogra* sites, whereas in *Shirajgonj* field, respondent added pulses, milk and fishes more in their diets in comparison to last five years. In *Kaunia* they have added more fish, vegetables and fruits in their daily diet.

Through qualitative investigation study attempted to know individual woman’s food intake by food category. In this exercise respondents were asked to identify frequency of meal they have consumed over the preceding 24 hours, then to describe food they have taken by each meal. After that all the responses were categorized by 12 food groups which is identified as standard HDD (Household Dietary Diversity) measurement scale by FANTA. The findings show that majority women participants of SDVC are consuming number of variety foods. Almost 35 per cent have access and consume more than 7 food groups that includes rice, potato, vegetables, meat, fish, milk, oil, egg and fruits. (for details see: annex).

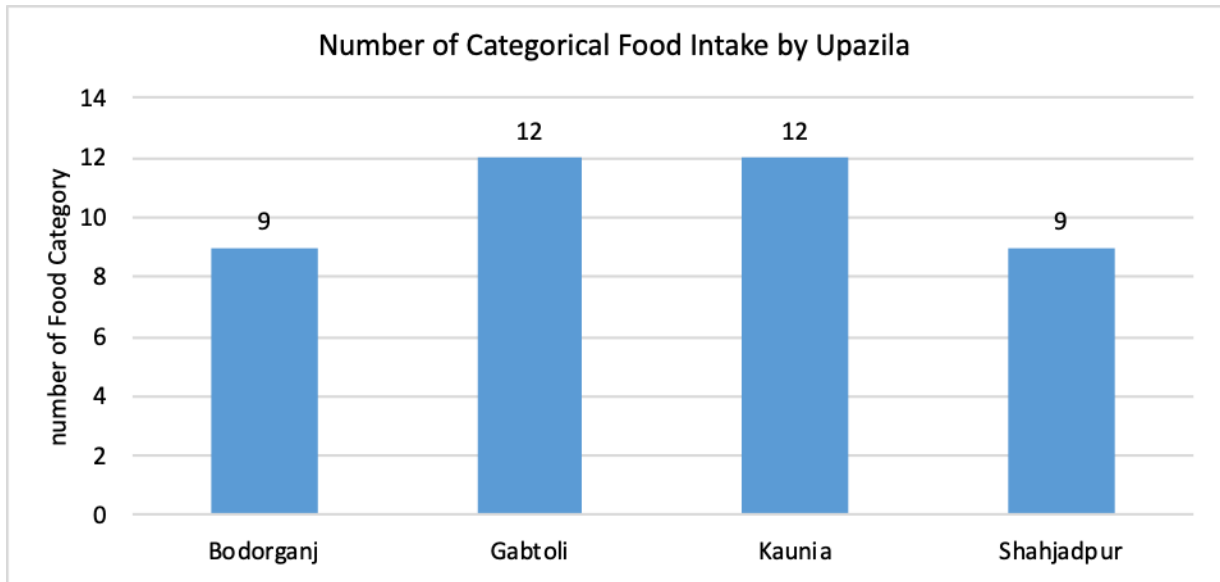
Graph 1: Percentage of respondents by number of categorical food intake a day



However 24 per cent of the respondents consume food from 3-4 categories that are mostly, rice/wheat, potato, fish or vegetable and oil. The food consumption pattern varies across the study *Upazilas*.

For example, *Kaunia* and *Gaboli* consume more variety of foods while *Badargonj* and *Shajadpur Upazila* have less diverse food. Both high food variety consume area have the most access to the market and availability in terms of crop production whereas other two *Upazilas* have less access to the market and both are single crop area. Apart from income other factor such as accessibility plays an important role in food consumption. For example the poor household who sales vegetables eat vegetables regularly however household from same area consume less vegetable due to unavailability.

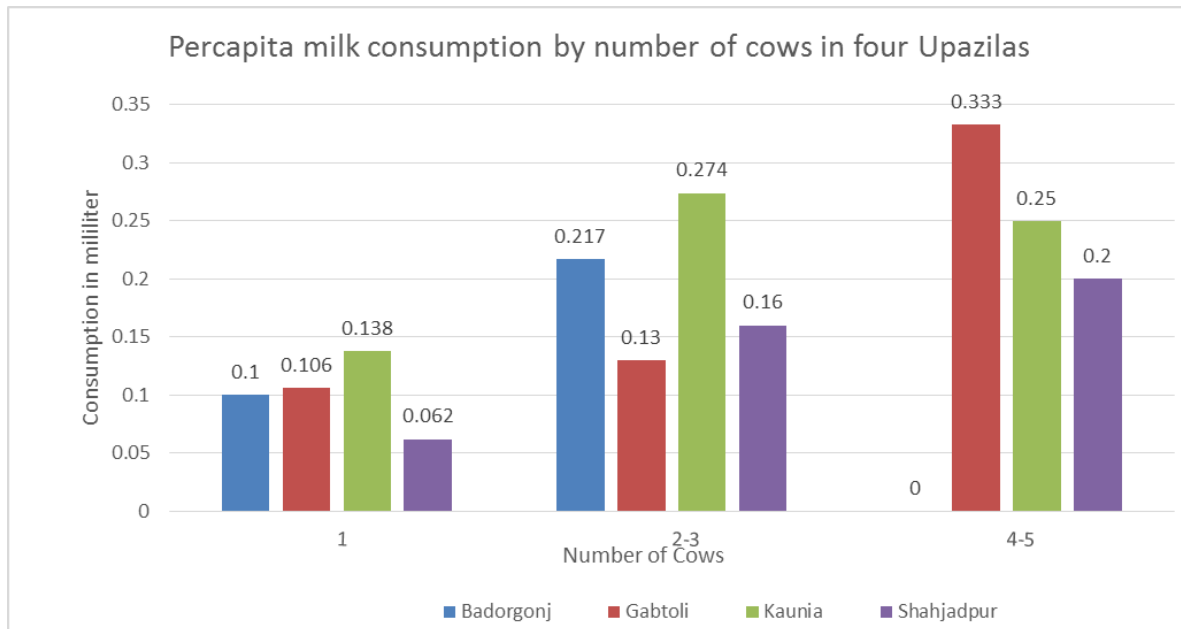
Graph 2: Variety of food consumption by study Upazila



The villages where women do not have access to market or men can't go market regularly due to bad road communication, long distance or work load and locally produce less multiple crops they consume less diverse food such as, people of *Shahjadpur* and *Badargonj*. In contrast, *Kaunia Upazila* is a three crops area where people cultivate multiple crops including livestock. The people of this site have easy access to market and consume food from diverse food categories. Similarly people of *Gabtoli Upazila* have access to variety of foods, since it's a vegetable production hub, villagers utilize more than 10 category foods. There is no direct association has been observed between amount of milk consumption and dietary diversity, however increased income from milk selling have positive correlation with dietary diversity. This has been discussed in the following section.

Consumption of milk in SDVC farm family: It is expected that household with access and availability of cow's milk will consume more milk than other household. The SDVC households consume 125-175 milliliter milk per capita which is higher than an estimated 44 milliliters of milk per day (WWW. The dairy sites.com, The Bangladesh Dairy Market; Times of Change, 2013) than national average. It should be noted that the SDVC project participants are mostly lower income group of people and their family size is in average 5. Household from same strata in the study sites have less access to cow's milk hence consume less milk.

It is important to note that amount of milk consumption of producer group not merely depend on amount of production rather it depends on market price, livelihood options, seasonality and so on.



Graph: 3 Per capita milk consumption by SDVC participants

It is interesting that when milk production is high and market price is also high, people tends to sell more than consumption whereas when price is low, milk producer family consume more milk . On the other hand household those have other sources of income rather than selling milk they consume milk at a certain level regularly than household have less income earning options or households mainly depends on selling milk consume less.

“The SDVC participants consume 125-175 milliliter milk per capita which is higher than national average, national per capita milk consumption is

Number of cows and types of breed also plays positive role in milk consumption. It is evident both in *Kaunia* and *Shajdpur* (graph no) field sites, that producer have more than three cows consume more milk than producer have less number of local breed cows. Since producer with multiple high breed cows have already gain capability of managing cows and confident to rare high breed cows, those households are producing more milk and consuming more milk. Though due to their involvement with SDVC project they have learn good practices of cow raring and its management as a result they are getting at least double of milk that contributed to increasing at certain extent of milk consumptions among them compare to before the period of project intervention.

FATEMA, 30 years old, group member of Botiabhangra, Gabtoli says, “Agye 1.5 liter dudh hoto, ekhon 20 liter dudh hoi’(Before joining project cow had produced 1.5 liter milk now we get 20 liter milk). Almost majority

respondents of this study say that in average household level milk production has increased almost double and in some cases more than it.

“Now cow gives good amount of milk and we drink milk every day when cow gives milk, however during lean period of milk production, we do not have milk regularly and do not buy milk from market for household consumption. However some of us sometimes buy milk from the market for their own consumption, says a group participant at FGD session at Gabtoli, Bogra district.”

Study has shown that households who have less number of cows are comparatively less or three years old group member and they are not fully acquainted with adequate skills of rearing high breed cows. As a result they get less amount of milk from local breed cow and prefer to sell it in the market rather consumption. However villagers who have less knowledge and capability to manage cross breed prefer to rare local variety cow and less number of cows and get less milk.

Ayesha Begum a 32 years old women, leader of Batia Char Para milk Producer and Marketing group says, before SDVC project our only source of income was selling water for irrigation and we had only one cow. In 2011 Ayesha joined SDVC project, she learnt about rearing cross breed cow and benefit of it. She started rearing cross breed cows and has increased number of cows in her farm. Now she have five high breed cows and five calves. In the Key Informant Interview, she says, now per day she gets 40 litter milk and per week she sells 10000 taka's milk. As because of her performance in 2015, she has been selected as group leader. Having good knowledge and access to inputs and output market, skills to manage farm is key to her success, she also added family support and determination are important to achieve the goal.

The existing (2015) M&E data shows, that three years old groups consume more milk in litter than younger groups. In same *Upazila* such as *Badargonj* where groups are matured and have more than two cows consume 1.33 liter milk which is greater than the households consume milk with having one-two cows. It's not only number of cows, from the qualitative investigation it is also reveal that types or breed of cows play an important role in milk production and consumption. Selection of cows for rearing also associated with local context and producer's choices. *Rmanathpur* a village of *Badargonj Upazila* is one of the best example of it, where comparatively low performing group member prefer to have local breed cow, they have less number of cows and get less amount of milk consume small quantity of milk in compare to other study village. Both from FGDs and KIIs it is revealed that community people are rearing local breed of cow (*Deshi cow*) instead of cross breed cows. Community people of *Ramanathpur* village think that artificial insemination is harmful for cow's health. Local breed cow size is small, so they think AI is not possible and they do not take the AI service. For successful Artificial Insemination (AI) needs to follow procedure more than once, it requires repeated attempts for success. It is well known that female cows go into heat once every 21 days, and

heat periods themselves last for 24 hours. However, villagers say that if the first time semen is void, it takes three months to come for next cow heat period. So they do not feel interested in Artificial Insemination. They also added that AI services doesn't supported by credit, in addition for cross breeding cow need more care on feed, treatment, vaccination, special cowshed. So for poor producers, it is difficult to manage all these things. On the other hand local (*deshi*) cow rearing is less expensive. They also added that despite having interest in fodder cultivation they cannot do it, since they do not have no land or access to land for fodder cultivation. The Key informant, of this discussion, one of the farmer leaders of *Ramanathpur* village says, there is no opportunity to cultivate fodder though many small farmers want to get involved in this input supplies. From the FGD discussion with same villagers and groups, participants say those who are involve in van-rickshaw pulling, agriculture labor or seasonal wage earning they have local breed cow and wants to get involve in the other work of the dairy value chain, such as fodder cultivation, input selling but do not have adequate support mechanism for that. In this village among three groups (90 HHs), 5-6 households have cross breeding cow and 10-12 households are involved in fodder cultivation. This explains milk consumptions depends on production, selection of cow breeds, income and livelihood dynamics. Besides it's also reflects to strengthening dairy value chain for resource poor producer require holistic intervention hence to improve their overall nutritional food intake.

Who consume more milk in the producer's household?

Besides milk consumptions, household level food and milk distribution pattern has also changed remarkably. Respondents say that the gender discrimination in milk consumption has reduced since women play vital role as producer and has acquired adequate skill in cow management, caring that ultimately has impacted positively on milk production. Hence their decision making power over milk consumption, selling and in distribution has increased.

Shapla 25 year's old Group member of milk a production group, kodomtoli village, Gabtoli, says, "DUJON AAY KORI, DUJON E KHAI SOMAN SOMAN" (now we both-husband and wife earn, so we eat equally).

Though women now have better utilization capacity compare to past 5 years however, the extent of changes are not same in all study areas. In few areas still men and boys gets first priority in milk consumption. This is most common in the household where availability of milk is less either for less number of cows or less production due to seasonality. Women think that man do hard work /menial work and which is more laborious so they need extra energy and they should get priority for having good food and milk too.

How SDVC and other factors have changed food consumptions pattern

The study attempts to explore changes in dietary diversity along with milk consumption habit of the SDVC group members. From the study it is revealed that multiple factors are responsible for determination of people's food consumption pattern. In the study area seasonality, income vis-versa availability of work and agricultural pattern have influence on food pattern and dietary diversity.

When there are more workload people fail to manage time to arrange diversified food even sometimes they skip food item and reduce frequency of food intake due to in-availability of time. This happens more with women agro-laborer. Households where both men and women work in the agriculture field in any particular season such as planting or harvesting of rice also shrink food quality and frequency. In contrast to this, when people with other occupation (non-agro laborer) such as weaver, shop owner, small businessman they have more work they have more income and they also consume good amount and quality of foods. In *Kaunia* one of the key informant says, that even when you need to invest more on crop production then there could be economic crisis thus have effects on food consumption.

In food consumption there are serious seasonal differences which have observed in the *Shajadpur, Sirajgonj* area, almost five months from summer till autumn (*Jashta-Ashwin*) they take very minimum and less diverse food due to severe work pressure. They cook once for full day consumption. This is single crop producing area, during this time they give full concentration on rice production and fodder storage for cow. In this area winter is the best time for having diverse food specially vegetables and fishes. On the other hand in same season, in *Gabtoli* sites of *Bogra* district, during this time profit comes from rice cultivation. Villagers usually have money in this time. So they celebrate occasions (*SAJON/LAYOR*), in this time creates milk demand. These months they earn both from agriculture and dairy. They can buy nutritional foods from market, they eat more frequently fish and meat, fruits e.g apple, grapes. They invite relatives at their house at this time. They also added that during winter, means in the following seasons they have more income compare to last five years. In this time, there have a lot of demand for milk in the community, as for traditional occasion held at every household (eg. *pitha, payesh* etc are made for families and relatives). And the milk price remains high. So, this month they can earn more by selling their dairy milk. Now the income has increased double than before joining the project (See Annex, Seasonal Calendar exercise).

"Dairy has created more work opportunity and income for lean seasons"

It is evident from the participatory discussion with number of 84 group members that due to introduction of SDVC project new employment opportunity has created and milk production has increased as because of better firm management skills. Both changes contributed to increase income hence this extra income has reduced three to four month's income gap and food shortage for those months. For example, the participants says 3-4 years back they have moderate income in November-December and in August ("*agyee magh, falgun ar vadro mashe aie chilo motamuti, kaj chilo na*", FGD, *Gabtoli, Bogra*) since they didn't had more work. Now

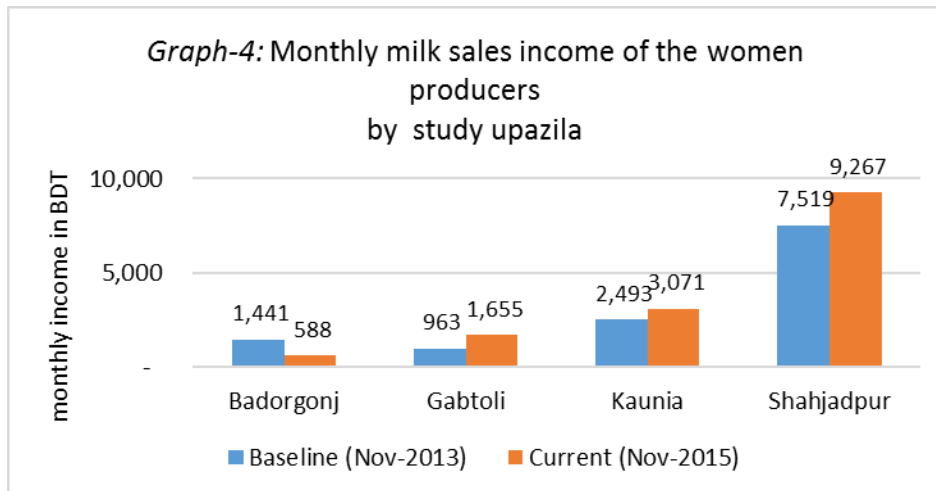
they are involved in dairy management and main earning source is milk selling. As before, they do not have cows and not income from dairy and its now double compare to past.

In similar discussion at *Kaunia, Rangpur* sites, two months September- October (*Ashin, Kartik*) and two months during March-April (*Falgun, Chaitra*) they had severe to moderate food, income and work crisis. In the seasonal calendar they have identified those months as lean period in terms of availability of work, food and income. In an average people had to reduce food intake and number of meal for those four months. Now they have extra income from dairy value chain activities which support them to improve the situation for those months.

In all study *Upazilas* October, November and March-April months have less work for agriculture, as there remain no crops at their agricultural fields. These months they now engage themselves in dairy caring, cattle business and other income generating activities related to dairy. They are now fully occupied with alternative work-dairy management and work load also has increased. Similarly, the farmer previously only involved in IRRI-28 harvesting between April-May month now they work almost doubled for those month and earn more since they are fully engage in dairy business. Now they have to do rice management as well as dairy

management at this time equally. In winter same happened for vegetable producer farmer, they now can earn from both milk and vegetables. In Jute producing area, farmer had less work during July-August since these months jute remains on field, now most of they are not involved in jute production. They sifted to dairy production. In all study locations, the SDVC project has created an alternative or additional income source and some areas it has increased income even from a single source because of better management and skills.

“SDVC has created more employment opportunity, more milk production and have ensured fair price which ultimately has reduced three-four months food insecurity of farm’s family’



Besides, the M&E data shows that the total income from milk sales has increased in all study Upazila except *Badorgonj* of *Rangpur* district. This extra income has been mostly spent in buying household food. From the qualitative exercise income-expenditure pie chart analysis it is found that income has increased from the source of cow/dairy business and new employment opportunity of household member.

From the seasonal calendar of Workload and Income analysis and M&E data it is clear that the intervention SDVC project has positively impacted to increase income and work opportunity for at least 3-4 months which was lean period and food deficit months. The degree of changes might varied, however significant change has placed in cattle management, they have adopted new knowledge and technology on dairy. After joining SDVC they knew a lot on it. Now they are using quality semen for AI, quality feed, pay for treatment, take preventative measures (deworming, vaccination, mineral mix) , cultivate fodder & hygienic measure for better health of cows what they did not practice before. Though it also increased cost compare to past and in-return they are getting higher profit too. They are more focused and dealing farming skillfully. It is noticed that male are also shifting their IGA activity now from cultivation to dairy.

Conclusion

It is clear that SDVC project indirectly contributed to improve group participant's food consumption and dietary pattern but not sharply changed dietary diversity directly as a whole since it is evident that dietary diversity merely not depends on any single factor i.e., increase income or availability of any particular product does not ensure dietary diversity rather it is depends on total agricultural and market system where community live and their livelihoods influenced.

Most importantly the project has reduced food deficit months, lean months for work and income gap in all sites at least for 3-4 months which is ultimately contributed to increasing food security for SDVC producer groups. It has opened up new employment opportunity for the rural

farm family and most importantly it makes more systematic involvement of women in this sector. Women are now more knowledgeable and their contribution now more visible which has increased their entree as a producer.

It is also noticed that expenditure has increased on dairy management. Previously they had no idea on new technology and management practice on dairy. After joining SDVC they knew a lot on it. Now they are using quality semen for AI, quality feed, pay for treatment, take preventative measures (de-worming, vaccination, mineral mix) , cultivate fodder & hygienic measure for better health of cows what they did not practiced before. Like *Bogra* it is also noticed that in *Rangpur* site both income and expenditure have increased in livestock cultivation, it requires more cost benefit types of analysis to figure out tradeoff of this investment.

Though SDVC has attempt to establish systematic dairy value chain and make it profitable for resource poor farmer/producer however for small to medium farm family need technical support to flourishing their dairies from both private and public sector. For grazing cows, the government must allocate *khas* land which is often left unproductive. Farmers should have access to easy and soft loans. Technology need to transfer at pace and volume to make farmer innovative about cattle feed. Subsidies can be given on cattle feed. Many farmers have sold their cattle because they could not make enough money to raise them by selling milk. More in-depth study is needed for further investigation.

It is proved that learning certain skills can lead to higher production. SDVC participants have adopted some of the techniques and getting good results such as they are not apply oil to the teats before milking or pull them hardly which is harmful for animal and it makes cow agitated or scared. They allow calf to drink before milking the mother cow. All these contributed to increase milk production and quality of milk which ultimately impacted on producer's wellbeing. The biggest achievement of this intervention is, it made small milk producer to believe that they can shift from subsistence to commercial farming through establishing solidarity groups and market linkage with adequate knowledge. Specially its contributed for rural women at different level to increase their self-esteem through providing them technical knowledge on cows feeding, AI, cleaning, and united them to share and solve problem for common interest, that's helped to encourage them to move forward take decision on cows management to household food consumption. Better linkage with border input-output market and community people at larger scale helped women to understand the dairy chain for getting better price. Overall the SDVC project has created a combination of positive impact on small level milk producer to be skill, unite and opening option for better earning opportunity that reduce food deficit.

Annex:

Cow Size	Badorgonj			Gabtoli			Kaunia			Shahjadpur		
	SDVC I&II	SDVC II	Total	SDVC I&II	SDVC II	Total	SDVC I&II	SDVC II	Total	SDVC I&II	SDVC II	Total
1	1.0	1.0	1.0	0.9	1.3	0.9	0.9	0.8	0.9	0.8	0.8	0.9
2-3	1.7	1.0	1.2	1.1	1.5	1.1	1.4	0.9	1.2	1.0	1.0	1.1
4-5		3.0	3.0	1.0		1.0	1.0	0.5	0.8	1.0	1.0	1.3
6+								0.5	0.5			0.5
Total (All Upazila)	1.2	1.1	1.2	0.9	1.4	1.0	1.0	0.8	0.9	1.0	1.0	1.0

“Dietary diversity as a measure of household food access and food consumption can be triangulated with other food-related information to contribute towards providing a holistic picture of the food and nutrition security status in a community or across a broader area.

Dietary diversity questionnaires are increasingly included in food and nutrition security surveys to provide indicators of household food access or individual dietary quality.”

Example: The percentage of households or individuals that consumed plant foods rich in vitamin A during the last 24 hours is calculated using the following formula:

Number of households/individuals that consumed vitamin A rich vegetables and tubers OR dark green leafy vegetables OR vitamin A rich fruits

_____ x 100
Total number of respondents

Analysis of Food and Nutritional Data

Regions	# of FGD	# of Respondents
Bogra	2	26
Rangpur	2	29
Sirajganj	2	29
Total	6	84

[All respondents were women]

Food Category	Bogra	Rangpur	Sirajgonj	Total
Food Category 1_ Rice, bread, noodles or other cereal food	31	35	35	100
Food Category 2_ potato,arum,carrot or other root food	26	27	0	54
Food Category 3_ Vegetable	31	25	33	89
Food Category 4_ Fruit	10	2	1	13
Food Category 5_ Meat (beef,mutton,chicken,duck)	8	10	14	32
Food Category 6_ Fish (fresh or dry)	24	21	23	68
Food Category 7_ Bean, pulse or nut	23	20	7	50
Food Category 8_ Milk, curd or any milk product	17	12	15	44
Food Category 9_ Oil, fat or butter	20	33	0	54
Food Category 10_ Sugar or honey	7	2	1	11
Food Category 11_ Tea or Coffee	1	25	0	26
Food Category 12_ Other (egg)	17	19	17	52

Food taken on last 24 hours:

Name	Breakfast	Lunch	Afternoon snacks	Dinner
Mst.Shamoli Begom	A)Muri B) Rice,Brinjal, potato,chilli,fish, pumpkin,onion, garlic	Rice,pumpkin,potato, egg, garlic, chilli, onion, oil.	NIL	Rice,Potato, egg, oil, onion,milk, cake

Mst.Khaleda Begom	A)Rice, gourd B)Rice,bean, potato, small fish	Rice,bean, onion,garlic, mastered oil	NIL	Rice, gourd, small fish
Mst.Zulekha Begom	a) Puffed rice,biscuit, chanachur b)Rice, small fish, potato,brinjal, onion,garlic,chili,oil	Rice, small fish, Potato, brinjal, onion, chili, oil, garlic,dal	NIL	Rice, potato, tomato, onion, chili,oil,garlic
Mst.Rujena Begom	Rice, small fish,green banana, onion,garlic,chili, oil,ginger	Rice, egg, onion,garlic,chili, oil,ginger	NIL	Rice, small fish,gourd, onion,garlic,chili, oil,ginger
Mst.Rube Begom	Rice,pumpkin, egg,oil, chili, onion,garlic	Rice,pumpkin, egg	NIL	Rice, potato,oil,milk
Mst.China Begom	a)Tea, bread(ruti) b) Rice, red amaranth	Rice, small fish, red amaranth, tomato, oil, chili, onion, garlic	NIL	Rice, dal,green banana
Mst.Zakia Begom	Bread (ruti), egg	Rice, potato,small fish,Boroi	NIL	Rice,pumpkin, green papaya,dal,milk, banana
Shapla Begom	Egg,banana,bread (ruti)	Rice,potato,bean,small fish,brinjal,dal	Puffed rice,biscuit,sweet, cake	Rice, meat,vegetable, Milk
Mst. Helena	Rice, cabbage, potato, dal, mutton, salt, oil,onion, garlic,chili,	Rice, Potato, dal, egg, salt, oil,onion, garlic,chili	NIL	Rice, Brinjal, Potato, Small fish ,tomato, salt, oil,onion, garlic,chili
Mst. Sweety	A)Rice,dal,potato, brinjal,oil, onion,	Rice, dal, chicken, fish,oil, onion,	Biscuit, Chanachur,	Rice, fish,Potato, pumpkin,

Begom	garlic,chili B) puffed rice	garlic,chili	Grapes,Bread (ruti)	oil,onion,chili
Mst.Ronjona	A)Puffed rice B) rice,chicken, potato,bean	Rice,dal, potato, onion,chili,mustard oil	NIL	Rice, fish

PICTURE OF SEASONAL CALANDER (Poster/picture of 07 March need to be added)

- Seasonal Calendar: Village: Kodomtoli
- Union: Nepaltoli
- Upazilla: Gabtoli Zilla: Bogra

English months vs Bangali months		Mid April- mid Ma	Mid May- Mid June	Mid June- mid July	Mid July- mid August	Mid-august- mid Sept	Mid Sept- mid Oct	Mid Oct- mid Nov	Mid nov- mid Dec (Agrahavan)	Mid Dec- mid Jan	Mid Jan- mid Feb	Mid Feb- mid March	Mid Mar- mid April (Chaitra)
	Work load	Present											
	Before												
Food	Present												
	Before												

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