Effect of snow harvest plastic pond irrigation in apple orchard of Jumla district:

Jumla, first organic district of Nepal is the leading district for apple production in terms of production and area coverage in Nepal. According to DADO, Jumla apple farming has been adopted by about 16000 household with an area of 2750 Ha and 5500 Mt production from fruiting area of 750 ha. Although the area coverage and quantity of production is increasing every year, the quality is not improved as demanded by the market. The apples are being cultivated in sloppy terrain where there are no water sources to irrigate apple trees in dry season. Moreover the existing water sources are being depleted every year due to climate change. The focused group discussion conducted with approx. 600 farmers during preparation of Ten Years Agriculture Development Plan of Jumla district revealed that lack of irrigation was one of the major problem faced by apple growers. Since irrigation is one of the critical factors for quality improvement in apple farming, a concept note was developed by DADO Jumla to conduct an action research in farmer’s field to collect snow via construction of plastic pond. Field experiences of water harvesting in plastic pond and use in irrigating vegetables in mid hills of Nepal guided us to conduct the action research on snow harvest plastic pond irrigation system. The idea was to find whether the snowfall could be collected in Silpolin plastic pond, measure the water after melting, numbers of plant that could be irrigated with the water collected and quality improvement after irrigation in critical stages of apple trees.

The action research on snow harvest was conducted in 3 farmer’s apple farm in collaboration with Surya Samajik Sewa Sang (a local NGO), DADO, Jumla and SNV, Nepal. The detail of the action research process and its finding is as follow:

Size of the plastic pond: The farmers were provided training to prepare a pond of size 3m×1.1m×1.2m during the month of Ashoj/Kartik. The silpolin plastic of 150 GSM size was put inside the pond just before the initiation of snowfall. The total cost of each pond ranged from Rs 9-10 thousand including labor cost to dig the pond.

Snow collection: During the study period, the snowfall occurred several times in a span of 3 months. Each time after the snowfall was collected in the plastic pond. The snow can be collected by rolling it to make circular ball
shape appearance that can be carried and put it carefully in the plastic pond.

Amount of water collected: The amount of water collected in all 3 apple farm from 3 consecutive collection of snow was 3710, 4110, and 4310 Liters respectively measured after melting. The average water that was harvested from the snowfall was 4044 Liters/pond.

Application of water in the apple trees: The total amount of water generated after melting of snow during end of March was applied @ of 5 Ltr/ plant (age of 10 yrs) with mulching in 5 critical stages namely Fertilizer application - i.e. end of Magh, Bud sprouting period - i.e. end of Falgun, Flowering time- i.e. 2nd week of Chaitra, Fruit set- i.e. end of Baisakh and Marble size fruit-i.e.2nd week of Jestha) amounting to 25 Ltr per plant in total. The average water harvested (i.e. 4044 Lt.) in each pond was enough to irrigate approximately 120-130 plants in the orchard. However the need of plants might be more than this depending upon the soil type, landscape etc. But the study paved an alternative way for managing scarce water that can be collected from snow and use in critical stages of apple tree.

Effect of irrigation v/s non-irrigated plants: In order to find the effect of irrigation compared with non irrigated trees, 27 apple trees were irrigated at 5 different stages of apple production checked with same no. of apple trees without irrigation. Some qualitative parameters like fruit size, no of fruit/kg and Total Soluble Solid (TSS) content was recorded. The number of ‘A’ grade fruits was more in irrigated plants as compared to non-irrigated. Similarly, the no. of fruits/kg in irrigated apple trees weighted from 6-8 in numbers compared with 9-12 fruits/kg in non-irrigated trees. The Brix percentage in all irrigated 27 plants ranged from 11-14 as compared to 10-12 in non-irrigated plants. With this success the technology was demonstrated in 150 farmer’s orchard in FY 2071/072 by DADO, 4S and some other non NGOs.

Way forward:

Since the technology is being accepted in some about 200 farmers from 2014 onward, the government and non government organization in the Karnali region can replicate in other districts too. The snow harvest irrigation technology can also be used to cultivate vegetables in kitchen/home garden during the period of March/April-June/July in Jumla and Karnali region. These are the dry periods in Karnali region where vegetables could be produced as offseason.

Now, the immediate need is to legalize the findings by developing directives on Technical parameters and construction mechanism. The developed directives could be endorsed from District Development Council. Once the directive is endorsed, GON could be lobbied to integrate the technology in government programs.

(For details of the technology can be contacted to: dhan.kathayat123@gmail.com), Surya Samajik Sewa Sang, DADO, Jumla.