

REPORT ON MORE CROP AND INCOME PER DROP OF WATER

Ministry of Water Resources Government of India

Report on "More Crop & Income per Drop of Water"

I. Background

The Ministry of Water Resources had constituted an Advisory Council on Artificial Recharge of Ground Water under the Chairmanship of Prof. Saifuddin Soz, Hon'ble Minister of Water Resources. The first meeting of the Council was held on 22nd July'06 at Vigyan Bhawan, New Delhi and was inaugurated by Dr. Manmohan Singh, Prime Minister of India. In his inaugural address, the Prime Minister mentioned that "We have to minimize our water use - invest in science and technology to ensure that we can grow crops which use less water. In other words, find ways of valuing the crop per drop". To implement the suggestion of the Prime Minister, the Council in its first meeting constituted a Sub-Committee under the Chairmanship of Dr. M.S.Swaminathan to prepare a report on "More Crop and Income per Drop of Water". The Sub-Committee consisted of representatives of Ministry of Agriculture, Ministry of Rural Development, National Fishery Development Board, CGWB, CWC, Confederation of Indian Industries (CII) and Agricultural Scientists from IARI, CRIDA, CAZRI, ICRISAT and State/ Central Agriculture Universities/ Institutes. The Sub-Committee held two brainstorming sessions to come out with its report. The report was presented by Dr. M.S.Swaminathan to Hon'ble Minister of Water Resources on Gandhi Jayanti the 2nd Oct'06.

Speaking on this occasion, Dr. Swaminathan said that the report gives details of implementable action plans incorporating technologies along with their economics. The steps that can be taken for Rabi crops have been highlighted so that action can begin from ensuing Rabi season itself. He also said that the report is being presented on 2nd October, the birth anniversary of Mahatma Gandhi to remind ourselves of the eternal truth behind Gandhiji's statement "Nature provides for everybody's needs, but not for everyone's greed". On this day we dedicate ourselves to replacing the spread of greed revolution with ever-green revolution based on the Principle of Jal Swaraj. He further expressed the hope that the Government will accept the recommendations of the Sub-Committee which will go a long way in increasing agricultural output and resultant income of the farmers. He thanked Dr K.Palanisami and Shri S.M.Sood for their outstanding contributions to the preparation of the Report.

II. Spreading technologies efficient in water use and economically beneficial

Already successful technologies have been developed by different institutes in different agro-ecological regions and they need to be up-scaled to benefit larger community. For example, in Madhya Pradesh in 2 m ha water logged regions, with the broad bed and furrow (BBF), short duration soybean cultivars like Samrat along with balanced nutrient management options and minimum tillage for chickpea/wheat crops could double farmers' incomes and minimize land degradation. In Indo Gangetic Plains (IGP), simple seed priming technique i.e., soaking chickpea seeds in water and micronutrient solution for six hours and drying in shade could establish good chickpea crop in rice fallow areas and increase crop production and incomes by using residual soil moisture. This technology can be applied in 12 m ha rice fallows in India spread in MP, Orissa, Jharkhand, West Bengal and Chattisgarh.

In Kashmir region, micro-irrigation @ 70m³/ha in 10 irrigations during reproductive period increases productivity of saffron by over 50%. Apple yield can be increased to more than 40t/ha using pressurized irrigation system in karewas. Strawberry under low cost poly-house matured 45 days earlier than outdoors and productivity increases substantially.

In Tamilnadu, precision farming approach involving drip and fertigation and pit method of irrigation in sugarcane increased the-yield and income of the crops by 20 %. In Gujarat, G-9 variety of drilled paddy increased the crop productivity to 2.5 tons/ha with high water use efficiency. In the coastal regions, about 10 million ha. are water logged in coastal Orissa, Andhra Pradesh, West Bengal and Bihar. Digging out aquaculture ponds raised about 35% of the area under embankment by 1-1.5 metres. Growing fish and prawn in dugout ponds and fruits and vegetables in embankments and rice in part of the farm increased the water productivity up to 7 times.

III. Highlights

It is important to popularize System of Rice Intensification technology (SRI) which requires less quantity of seeds, less nursery area, saves water and labour and enhance yield. This method can be extended to other

crops like sugarcane. Further, upland rice technologies like periodical wetting and drying should be expanded wherever possible. This will also help in the control of mosquito breeding in the rice fields.

Micro Irrigation technology e.g. drip and sprinkler irrigation including drip fertigation to increase productivity of crops with less water should also be popularized with adequate support from the Government.. Needed credit facilities should be available to the farmers to pay for the equipment.

Our soils are not rich in nutrients and hence supply of sufficient and balanced nutrients to the soil through Integrated Nutrient Management will enhance soil health and the yield of the crops. Particular attention is needed to the supply of micro-nutrients like zinc, boron and sulphur.

Since water shortage is experienced in different seasons, promotion of crop diversification with high value but less water requiring crops like pulses and oil seeds and multiple uses of water will enhance crop yield and income of the farmers. Hence demonstrations and adaptive research programmes will be very useful- Farmers normally face price uncertainties. Hence, adequate support for marketing and market information be given to farmers. Suitable models of farming systems, i.e., crop-livestock integrated farming should be encouraged and experimented with farmers participation.

Since, crop insurance will safeguard farmers during weather uncertainties, introduction of weather based crop insurance for minimizing the losses to farmer is also recommended. A credit linked development plan for homogeneous area can be prepared in coordination with banks, farmers, traders, processors, exporters, NGOs, Panchayats and Government Development Departments.

In order to implement successfully the recommendations, a 3-tier setup at Village, State and National level is suggested. At National level a Pan Government of India Steering Committee consisting of representatives of various Departments associated with irrigation, agriculture and Planning Commission, Finance, NABARD, Mass Media etc. has been suggested. The Steering Committee may report to Agricultural Coordination Committee, chaired by the Prime Minister.

Given the importance of the subject, adequate provisions in Eleventh Plan for inclusion of the measures for augmentation of water supply such as water control measures, bench marking of irrigation projects, reforms in water harvesting norms, refocusing on tanks and ponds as main water harvesting components be made. For demand management side, provisions for micro irrigation 'techniques like drip/ sprinkler including drip fertigation, system of rice intensification technique, improving soil health, weather based crop insurance, market improvement and capacity building will be included. To keep pace with the future demand, A Research Network on biotechnology and water security is also recommended, Given the strategies and their importance in improving the productivity and income per unit of water, solid action plans are needed. Hence, year 2007-08 may be declared as the Year of More Crop and Income per Drop of Water with the simultaneous implementation of 5000 Farmer Participatory Action Research Programmes with the help of Agricultural Universities, Research Institutes, ICRISAT, WALMIs, etc .

The Farmer Participatory Action Research Programme can cover during 2007-08, 5000 villages in different agro-climatic regions. In such village, all the available technologies will be taken to farmer's fields, jointly with farm families. In these 5000 villages, 1 woman and 1 man from every panchayat will be trained as Water Masters. In addition, a water literacy movement will be launched. This programme will involve the participation of 50 Agricultural Universities, ICAR institutes, ICRISAT and WALMIs. Data on both the water saved through efficient use and the additional income earned will be calculated.

The Gram Sabhas in the villages will serve as Pani-panchayats and will provide overall guidance and support to this programme. The Farmer Participatory Action Research projects will be so designed that a small government programme involving an outlay of Rs 25 crores can trigger a mass movement for more yield and income per drop of water.