



**COMMITTEE ON AGRICULTURE  
(2009-2010)**

**FIFTEENTH LOK SABHA**

**MINISTRY OF AGRICULTURE  
(DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION)**

**IMPACT OF GLOBAL CLIMATE CHANGE ON AGRICULTURE  
AND ALLIED SECTORS IN INDIA**

**{Action Taken by the Government on the Observations/  
Recommendations contained in the Forty-seventh Report (Fourteenth Lok Sabha)  
of the Committee on Agriculture (2008-2009)}**

**TENTH REPORT**



**LOK SABHA SECRETARIAT  
NEW DELHI**

May, 2010 / Jyaistha, 1932 (Saka)

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**Action Taken by the Government on the  
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(Fourteenth Lok Sabha) of the Committee on Agriculture (2008-2009)**

Presented to Hon'ble Speaker on 17.06.2010

Presented to Lok Sabha on

Laid on the table of Rajya Sabha on



**LOK SABHA SECRETARIAT**

**NEW DELHI**

May, 2010 / Jyaistha, 1932 (Saka)

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**COMPOSITION OF THE COMMITTEE ON AGRICULTURE (2009-2010)**

Shri Basudeb Acharia - Chairman

**MEMBERS**

**Lok Sabha**

2. Shri Narayan Singh Amlabe
3. Shri K.C. Singh 'Baba'
4. Shri Thangso Baite
5. Shri Jayant Chaudhary
6. Smt. Shruti Choudhry
7. Smt. Ashwamedh Devi
8. Shri Biren Singh Engti
9. Smt. Paramjit Kaur Gulshan
10. Shri Anant Kumar Hegde
11. Shri Sk. Nurul Islam
12. Shri Naranbhai Kachhadia
13. Shri Surendra Singh Nagar
14. Shri Prabodh Panda
15. Shri Premdas
16. Shri Vitthalbhai Hansrajbhai Radadiya
17. Shri Nripendra Nath Roy
18. Shri Bhoopendra Singh
19. Shri Uday Singh
20. Shri Jagdish Thakor
21. Shri Hukmdeo Narayan Yadav

**RAJYA SABHA**

22. Shri Narendra Budania
23. Shri Satyavrat Chaturvedi
24. Shri A. Elavarasan
25. Shri Sharad Anantrao Joshi
26. Shri Vinay Katiyar
27. Shri Mohd. Ali Khan
28. Shri M. Rajasekara Murthy
29. Shri Bharatsinh Prabhatsinh Parmar
30. Prof. M.S. Swaminathan
- \*31. Vacant

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\* Vice Shri Kheikiho Zhimomi who ceased to be a member of the Committee on his retirement from Rajya Sabha on 2 April, 2010.

**SECRETARIAT**

1. Shri S. Bal Shekar - Joint Secretary
2. Shri P.V.L.N. Murthy - Director
3. Shri P. C. Koul - Additional Director

## INTRODUCTION

I, the Chairman, Committee on Agriculture (2009-2010) having been authorized by the Committee to submit the Report on their behalf, present this Tenth Report on Action Taken by the Government on the observations/ recommendations contained in the Forty-seventh Report (Fourteenth Lok Sabha) of the Committee on Agriculture (2008-2009) on 'Impact of Global Climate Change on Agriculture and Allied Sectors in India'.

2. The Forty-seventh Report of the Committee on Agriculture (2008-2009) on 'Impact of Global Climate Change on Agriculture and Allied Sectors in India' was presented to Lok Sabha and laid on the Table of Rajya Sabha on 25 February, 2009. The Ministry of Agriculture (Department of Agricultural Research and Education) furnished their Action Taken Notes on the Observations/Recommendations contained in the Report on 15 September, 2009.

3. The Report was considered and adopted by the Committee at their Sitting held on 17 May, 2010.

4. An analysis of the Action Taken by the Government on the Observations / Recommendations contained in the Forty-seventh Report (Fourteenth Lok Sabha) of the Committee is given in **Annexure**.

**NEW DELHI;**  
**20 May, 2010**  
**30 Vaisakha, 1932(Saka)**

**BASUDEB ACHARIA**  
***Chairman,***  
***Committee on Agriculture***

## CHAPTER I

### Report

This Report of the Committee on Agriculture deals with the action taken by the Government on the recommendations contained in the Forty-seventh Report (Fourteenth Lok Sabha) of the Committee on Agriculture (2008-2009) on 'Impact of Global Climate Change on Agriculture and Allied Sectors in India' which was presented to Lok Sabha and laid on the Table of Rajya Sabha on 25 February, 2009.

1.2 The Ministry of Agriculture (Department of Agricultural Research & Education) have furnished Action Taken Replies in respect of all the 23 observations/recommendations contained in the Report. These have been categorised as under:

- (i) Observations/Recommendations that have been accepted by the Government:  
Recommendation Nos. 1, 5, 8, 9, 11, 12, 13, 17, 19, 21 and 23
- (ii) Observations/Recommendations which the Committee do not desire to pursue in view of the Government's reply:  
Recommendation Nos. 4, 6, 7, 14, 18 and 22
- (iii) Observations/Recommendations in respect of which action taken replies of the Government have not been accepted by the Committee:  
Recommendation Nos. - NIL
- (iv) Observations/Recommendations in respect of which final replies of the Government are still awaited :  
Recommendation Nos. 2, 3, 10, 15, 16 and 20

**1.3 The Committee trust that utmost importance would be given to implementation of the observations/recommendations accepted by the Government. In cases, where it is not possible for the Department to implement the recommendations in letter and spirit for any reason, the matter should be reported to the Committee with reasons for non-implementation. The Committee further desire that Action Taken notes on the observations / recommendations contained in Chapter-I and final action taken replies to the**



**recommendations contained in Chapter-V of this Report be furnished to them at an early date.**

1.4 The Committee will now deal with the action taken by the Government on some of the recommendations in the succeeding paragraphs.

**Role and Responsibilities of DARE / ICAR in Global Climate Change (Recommendation Para No. 1)**

1.5 Concerned with the various adverse effects of global warming, the Committee had asked the Government to develop strategies at international, national, local including Panchayat level, and do agro-climatic research work with a view to develop measures for containment. They had also asked the Government to educate various stake-holders on this issue and for increased policy and financial support for agricultural research and establishment of 'Green Research Fund'. They had also recommended that DARE/ICAR should develop a drought code, a flood code and a good weather code at the earliest alongwith a concrete, constructive and feasible contingency plan for all agro-climate zones. Apart from this the Committee had also desired that a Compensatory Production Programme be developed expeditiously and with considerable attention and detailed planning based on relevant research to be done by DARE/ICAR for agri-allied sectors in case of natural calamities.

1.6 The Ministry of Agriculture (Department of Agricultural Research and Education), in their Action Taken Note have stated that they have a very strong network of research institutions located in different parts of the country which are also working on various aspects of climate change. Further, recently ICAR has established National Institute of Abiotic Stress Management at Baramati, Maharashtra to address the issues arising due to climate change in terms of abiotic stress on agriculture. The Ministry of Agriculture have already developed a Drought Code with inputs from DARE / ICAR. The suggestions of the Committee will be considered during the revision. Flood Code is being developed by National Disaster Management Authority, under the Ministry of Home Affairs. Good Weather Code will be prepared by DARE/ ICAR incorporating suggestions given by the Committee and interest of the stakeholders.

1.7 It has been further stated that all the 25 centres of AICRP on Agrometeorology and a few ICAR institutes are providing weather based agro advisories (Good weather code) at district level twice in a week to the farming community using the Medium Range Weather Forecast issued by IMD and the current crop conditions. The necessary research back stop in the form of agroclimatic characterization, crop weather relationships, influence of weather on pest/disease for preparing a good weather based advisories and its successful implementations was obtained from the research results generated at the centres of AICRP on Agrometeorology over the last two decades. Utility of crop simulation models to study the impact of various climatic scenarios on crop productivity, development of adaptation and mitigation strategies to meet the threat from climate change have been carried out extensively at AICRPAM centres and also at different ICAR institutes.

**1.8 The Committee note with satisfaction that based on inputs provided by DARE/ICAR the Ministry of Agriculture have developed a Drought Code. Likewise, the Flood Code is being developed by National Disaster Management Authority which functions under the Ministry of Home Affairs. They also note that though the Good Weather Code is yet to be prepared by DARE / ICAR, some ICAR institutes and 25 AICRP Centres are already providing weather based agro advisories at district level twice a week to the farming community using the Medium Range Weather Forecast issued by IMD and current crop conditions. The Committee, however, find it disconcerting to note the Department's silence on the crucial aspect of 'Compensatory Production Programme'. Keeping in view the multiplicity of agro-climatic zones in the Country and the fact that natural calamities like droughts, floods, etc. affect some part or the other of the Country almost every year, a 'Compensatory Production Programme', factoring requirements of all agro-climatic zones and taking care of all natural calamities, is essential for successfully tackling the adverse effects of global warming and climate change. The Committee, therefore, desire the Government to inform them of their considered views in regard to developing a 'Compensatory Production Programme, within one month of presentation of this Report to the Parliament.**

## **National Climate and Water Management Policies** **(Recommendation Para No. 2)**

1.9 Noting the lack of coordination and interaction between the various Ministries/Departments of the Central Government and the State Governments of Himalayan States, the Committee had recommended that the Central Government should take necessary initiatives to associate the Governments of these States with all Schemes/programmes related to Global Climate Change, its implications and solutions and help them financially and technically. On observing the shortcomings in rehabilitation of Tsunami and Kosi Flood affected people, the Committee had also recommended that Ministry of Agriculture and all other concerned Central Ministries/Departments to make coordinated efforts to find solutions to the floods/droughts/high temperatures/climate variations, etc. for the ultimate welfare of homo-environ systems of the Country.

1.10 In their Action Taken Note the Department have stated that this pertains to Department of Agriculture & Cooperation, Ministry of Agriculture and Ministry of Environment and Forest/ PMO as well as other Central Ministries. They have further stated that the ICAR is strengthening its research activities through the Network Project on Climate Change during the Eleventh Plan. It has already established a National Institute of Abiotic Stress Management at Baramati, Maharashtra and is in the process of establishment of another institute dealing with Management of Biotic Stress.

**1.11 The Committee would like to make it amply clear to the Department of Agriculture Research and Education that while recommending these measures in their original Report, the Committee were fully aware of the multi agency involvement in their implementation. Therefore, the response of the Department which is restricted merely to mentioning the names of various ministries/departments/agencies involved with the implementation is not only unfortunate but is reflective of an escapist tendency. The least the Committee expected from the Department in the context of this recommendation was that they would convey the views of the Committee to all concerned promptly so that appropriate action could have been initiated by them. Though a lot of time has already been wasted on the specious plea of jurisdictional constraints, the**

Committee desire the Department to communicate their instant recommendation to all concerned immediately. They would also like the Department to obtain feedback in the matter from all concerned and furnish the same for their information alongwith their own Action on Action Taken notes.

As regards the efforts made by the Department, the Committee note that an Institute on Abiotic Stress Management has been established in Baramati, Maharashtra and another Institute on Biotic Stress Management is in the pipeline. Keeping in view the fact that the climate change and its adverse effects are required to be tackled on a war footing with alacrity, the Department should make earnest endeavours to make the Institute on Abiotic Stress Management at Baramati fully functional without any further delay. The Institute on Biotic Stress Management should also be established, expeditiously after completing all relevant formalities.

**Awareness Campaigns on Climate Literacy and related Missions / Programmes among the Farmers / Commonmen**  
**(Recommendation Para No.3)**

1.12 Noting that most of the laws and other pro-active steps of the Government were not bearing optimal results due to lack of awareness amongst the target groups and stake-holders, the Committee had recommended that all the Central Ministries and their Departments and other Government agencies should take initiatives and make sincere efforts to inform, educate and propagate amongst the target groups and stakes-holders, climate change in all its positive and negative ramifications to make the Action Plan on Climate Change successful.

1.13 The Department in their Action Taken Note have stated that the importance of creating awareness about the weather and the positive and negative aspects of climate change among the farmers has been well recognized by ICAR. Through its coordinating projects on Agrometeorology and Dryland Agriculture, a mass awareness campaign on climate change was conducted during October 2008 at 37 research centres of both the projects. Farmers were exposed to the measurement of weather parameters in the observatory and their influence on agricultural crops. The feed back obtained from the farmers about their knowledge on importance of different

weather parameters was quite interesting. About 70-80% of farmers have some knowledge on the importance of weather elements on the incidence and spread of pest/diseases. This programme will be continued in each year. The current weather based agro advisories became popular among the farming community. This awareness programme shall also benefit the farmers in understanding and managing the weather resources properly for sustainable agricultural production.

As a part of collaborative programme between ACIAR, ANGRAU and CRIDA the Agrometeorologists at CRIDA, Hyderabad have participated in training farmers of Warangal and Mahabubnagar districts in Andhra Pradesh during 2008-09 seasons in utilizing the forecast issued by IMD and also the agro advisories for managing the agricultural crops efficiently for higher productivity. From the research results of various centres of AICRP on Agrometeorology over the last two decades, developing optimum weather indices at different important crop stages that influence the overall productivity is in progress. These indices shall help in developing weather insurance products that protect the farmers against climatic risks such as high intensity rainfall, heat and cold waves, drought, etc. At the same time all research institutions and SAU are being advised to take up this awareness programme in their respective areas for farmers and other stake-holders.

**1.14 The Committee note that the Department have conducted a mass awareness campaign amongst farmers during October, 2008 at 37 Research Centres to generate awareness about climate change and related matters. The Committee are not at all satisfied with this symbolic step of the Department. The rural community is to be made aware of the pros and cons of climate change in a highly proactive and sustained manner. The Committee also tend to disagree with the surmise of the Department that as per the feedback received on the mass awareness campaign in October, 2008, 70% to 80% farmers have some knowledge on the importance of weather elements on the incidence and spread of pest/diseases. The farmers, at best have traditional knowledge of the local weather and related matters. However, they are not aware of the cataclysmic changes that climate change can wreak not only on agriculture but also on their livelihood. The need of the hour, therefore, lies in unleashing a vigorous, well planned, easy to comprehend, audio-visual media**

**blitz alongwith sustained publicity through other tools of the Government agricultural extension services like SAUs, ATMA, KVKs, Research Centres, etc. so that the message about the effects of the ongoing climate changes is conveyed in very unambiguous terms to the farming community without any further delay.**

**National Policy/Action Plan to Control and Manage Water Logging problems  
(Recommendation Para No. 5)**

1.15 With a view to control the methane emissions from the water logged areas and marshy lands, especially in Himalayan and Indo-Gangetic Plains, the Committee had recommended that the Government should come out with clear-cut National Policy / Action Plan to check / control and manage water-logged / inundated areas, marshy lands for environment / climate-friendly uses.

1.16 In their Action Taken Note, the Government have stated that it is true that water logging is one of the main land degradation problems. Therefore, to reduce the ill effects of water logging and to improve water productivity, models for effective utilization of shallow water logged areas have been developed and demonstrated by ICAR Institutes. These models relate to secondary reservoir system for storing canal / rain/ seepage water for multiple uses and trenches and bed system for productive utilization of medium water logged areas. These systems have been demonstrated to farmers through various training programs organized in collaboration with State Water Resources, Agriculture and Fisheries Departments. At the same time, at WTCER, Bhubaneswar, research projects are being conducted on various drainage related studies.

At present, the Department are studying methane emissions from rice paddies. Non-agriculture water-logged areas and wet lands are generally monitored for methane emissions by Ministry of Environment and Forests and its related organizations.

**1.17 The Committee do not appreciate this *status quoist* mindset of the Department. When as per their own admission, water logging is one of the main reasons for land degradation, the issue cannot be wished away merely on jurisdictional handicaps. As the premier research organisation in the Country**

**ICAR should rather play a more proactive role in all such matters. From the professional point of view also, ICAR with their vast network of research institutions, dedicated pool of scientists and extension network are in a far better position to deal with this matter in comparison with the Ministry of Environment and Forests. The Committee, therefore, desire the Department to immediately get on to the task of developing a synergetic grid in tandem with the Ministry of Environment and Forests on the entire gamut of Climate Change and related matters for having time bound and result oriented solutions to this vexed problem.**

**Need to develop National Policy / Action Plan to encourage farmers to grow alternate crops along with Paddy Crops  
(Recommendation Para No. 8)**

1.18 Noting the substantial Methane emissions caused by paddy fields, the Committee had recommended that a nation-wide awareness campaign for farmers on watering system of paddy fields and to encourage them to grow other food crops to contain Methane emissions be launched. It was also recommended that Government should come out with a National Policy / Action Plan, Agro-climatic zone-wise suggesting / recommending alternate crop cultivation to bring economic prosperity and at the same time avoid rise in global warming.

1.19 In their Action Taken Note the Government have stated that technologies have been developed on efficient water management interventions in rice for reducing the Methane emissions. They are being popularized through network centers of All India Coordinated Research Project on Water Management, KVKs and Directorates of Extension of different State Agriculture Universities (SAUs) and State Departments of Agriculture. Alternate cropping systems for substituting rice based cropping system have been developed through Network Centers of All India Coordinated Research Project on Cropping System for various agro eco-regions of the country. These are being popularized through its Network Centers.

**1.20 The Committee note with satisfaction that alternate cropping systems for substituting rice based cropping system have been developed through the Network Centres of All India Coordinated Research Project on cropping system for various agro-regions of the Country and they are being popularized through**

the Network Centres. Though during the course of their examination, the Committee were given to understand that the quantity of Methane emissions in paddy fields in India is far less than what had been assessed initially, however, keeping in view the fact that these emissions in whatever quantities add to the Carbon footprint, the Committee desire that the alternate cropping systems for substituting the rice based cropping system developed by ICAR for the various agro-eco regions of the Country should be popularised through a vigorous media campaign. All other agencies viz. KVKs, ATMA, SAUs, State Agricultural Extension Networks should also be roped in for the purpose.

**Impacts of Climate Change on Agriculture/Allied Sectors due to rise in Sea Level**

**(Recommendation Para No. 10)**

1.21 It was recommended that DARE / ICAR should gear up their research efforts on all the pros and cons of the impact of climate change on agriculture and allied sectors due to rise in sea level. Development of salinity – tolerant crop cultivars should be given priority. The fishermen should get timely and advance forecasting about weather and cyclone in the high seas. The Committee had also recommended that Government should give more attention towards coastal forests and mangroves and towards building public awareness and other extension programmes on various aspects of climate change in vernacular languages.

1.22 The Government in their Action Taken Note have stated that in order to cope up with the intrusion of sea waters into the low lying coastal regions of the Country due to rise in sea level, research on development of salt resistant varieties that can come up well under salt affected soils are in good progress at CSSRI, Karnal and also at CRRRI Cuttack. Under the Network Programme on Climate Change CMRFI, Kochi is studying the possible impact of climate change on the migratory behaviour of different fish species of economic importance and also conducting experiments on the physiological changes that are likely to occur due to increase in sea surface temperature and salinity. CMRFI, Kochi in association with Indian National Centre for Oceanic Information Service (INCOIS) is participating in issuing advisories to the fishermen on the fish abundant regions in Arabian Sea.



The Ministry of Environment Forest and few NGOs like M.S. Swaminathan Research Foundation (MSSRF) have taken up mass campaign programmes among the people living in the coastal regions about the importance of mangroves in the coastal ecosystem and the need to protect the mangroves, a measure against threats from Tsunami, tidal waves associated with severe cyclones and increase in the mean sea level and subsequent inundation of low lying region.

1.23 In the Statement made by the Minister in Lok Sabha under Direction 73A of the Directions by the Speaker, Lok Sabha it has been further stated that DARE / ICAR have conducted surveys to identify villages vulnerable to sea level rise in coastal lands based on distance from High Tide Line criteria. Results of such studies will be helpful in estimating the cost of relocating the village and sensitising the fishing communities on perils of rising sea.

**1.24 The Committee note with satisfaction that pursuant to their recommendation ICAR has initiated research activities on several aspects including impact of sea level rise on soil health, development of salt resistant varieties, etc. at its various institutes. It is needless to emphasise here that while these research activities need to be conducted on priority basis, the results thereof are utilized productively and purposefully in tackling the problems arising out of global warming and climate change. The Committee also desire that the Council should complete surveys for identification of all villages vulnerable to the rising sea levels on top priority basis in a fixed time frame so that not only the cost of their relocation is estimated but also the population is sensitized about the likely implications and practical hazards of rise in sea-water levels.**

**R & D on Climate Change**  
**(Recommendation Para Nos. 15, 16 & 20)**

1.25 The Committee had recommended that DARE / ICAR should expedite and intensify their research and development work on all the major food grains, coarse grains, pulses, cash crops, oilseeds, horticultural / medicinal and aromatic plants, tuber and fodder crops, etc., with regard to likely negative as well as positive impacts of climate change and come out with remedial solutions / packages / technologies /

practices which can be conveniently and feasibly practiced and adopted by all the farmers / livestock producers in all the agro climatic zones of the Country. It had also been recommended that comprehensive estimates of fund requirement for meeting climate change scenario be also worked out by ICAR. Noting that due to lack of funds, the pace of ICAR research is not only unsatisfactory but also very slow. The Committee had recommended that Planning Commission / PM's Council on Climate Change / Ministry of Finance ought to help ICAR by providing more grants to them. The Committee had also recommended that DARE / ICAR should come out with comprehensive estimates of costs and best management practices for making our agro-socio-economy climate proof as this will help the research institutions to get the required funding from the MoF / Planning Commission; help appraisal agencies to appropriately allocate amongst various agencies; and help the Union Government to negotiate India specific concerns with the various international financial institutions / agencies funding climate change combating strategies.

1.26 The Department in their Action Taken Note have stated that DARE / ICAR are giving more emphasis on research related to developing adaptation and mitigation strategies to cope up the likely effect of climate change for various agro-climatic zones of the Country. Decision support systems and weather insurance products for managing climatic risks, drought / heat resistant varieties are also being developed at ICAR institutes. ICAR has already initiated work for preparing estimates of cost / funds required to abate the impacts of climate change.

They have further stated that ICAR has strengthened its research efforts by increasing the number of Centres from 14 to 23 in the Network Project on Climate Change and by increasing their budget allocation in the Eleventh Plan. At the same time several research institutes have intensified their efforts to develop heat / drought tolerant varieties. The ICAR has also established a National Institute on Abiotic Stresses at Baramati to address the challenges related to abiotic stresses. A National Institute of Biotic Stress Management is also proposed to be established in the Eleventh Plan. For additional grants, ICAR has already submitted a proposal to the Prime Minister's Council on Climate Change.

1.27 In the Statement made by the Minister in the Lok Sabha under Direction 73A of Directions by the Speaker, Lok Sabha it has been added that the two new research

institutes namely National Institute of Agricultural Biotechnology and National Institute of Biotic Stress Management are in the process of establishment.

**1.28 The Committee while taking note of the fact that ICAR has already initiated work for preparing estimates of cost/funds required to tackle the impact of climate change, desire that this task may be accomplished with due promptitude and in a highly time bound manner as a lot of further action including negotiating India specific concerns with the various international financial institutions/agencies funding climate change combating strategies hinge on them. They also recommend that the setting up of the two national institutes on Agriculture Bio-technology and Biotic Stress Management be expedited so that they are able to carry out the mandated responsibilities without any further loss of time.**

**Prevention of Emissions of Higher Green House Gases (GHGs) by Food Processing Industries  
(Recommendation Para No.23)**

1.29 In view of the technologies used by the Food Processing Industry releasing more green house gases emission, the Committee had recommended that DARE / ICAR should develop and come out successfully with modified alternative packages for FPI as they have an important role in finding technological possibilities and developing climatic stress resistant varieties.

1.30 The Government in their Action Taken Note have stated that in view of an urgent need to promote post harvest processing and value addition activities in production catchments, the following technologies are being promoted to reduce the emission of greenhouse gases in post harvest sector, viz., (i) evaporatively cooled storage houses for horticultural produce, (ii) solar dryers for reducing the moisture content to safe storage / processing levels, (iii) using cleaning / grading / packaging in production catchments to significantly reduce the quantity of commodity to be transported to consumers and processing industry, (iv) using crop residues to manufacture packaging boxes and (v) using Modified Atmospheric Packaging (MAP) to minimize the expenditure on refrigeration and thereby reducing GHG emissions. R&D efforts are also being made to continuously refine these technologies.

**1.31 The Committee note with satisfaction that their concerns have been addressed to some extent by the Government. The Technologies to reduce the emission of green house gases in post harvest sector viz. evaporatively cooled storage houses for horticultural produce; using crop residue to manufacture packaging boxes, using Modified Atmospheric Packaging to minimize the expenditure on refrigeration and thereby reducing GHG emissions; solar dryers for reducing the moisture content to safe storage/processing levels; and using cleaning/grading/packaging in production catchments to significantly reduce the quantity of commodity to be transported to consumers and processing industry are being promoted by the Government. The Committee, however, desire that since the green house emissions are a critical aspect in climate change, the R&D efforts should be continued ceaselessly, with renewed vigour, so that green house gas emissions are reduced to the minimum.**

## **CHAPTER II**

### **OBSERVATIONS / RECOMMENDATIONS WHICH HAVE BEEN ACCEPTED BY THE GOVERNMENT**

#### **Role and Responsibilities of DARE/ICAR in Global Climate Change & Indian Scenario** **(Recommendation Para No.1)**

The Committee observe that there is internationally accepted fact that climate is changing due to increased emissions of Greenhouse gases. Increased human activities in the last century, especially increased fossil fuel usage, industrialization and land use changes have caused the build up of Carbon Dioxide, Nitrous Oxide, Methane, Hydro-Fluoro-Carbons and other greenhouse gases in atmosphere and are changing in the climate of the earth and causing temperature rise, heat waves, drought, floods, snow melt and rainfall distributions at several places.

The Committee note that the global average of sea level rose at an average rate of 1.8 mm per year over 1961 to 2003 and about 3.1 mm during 1993 to 2003. Projected global mean annual temperature by the end of 21<sup>st</sup> century is likely to be in the range of 2 to 4.5<sup>0</sup>C and even the values substantially higher than 4.5<sup>0</sup>C cannot be excluded. For Indian region, according to IPCC, projected temperature rise is 0.5 to 1.2<sup>0</sup>C by 2020; 0.88 to 3.16<sup>0</sup>C by 2050 and 1.56 to 5.44<sup>0</sup>C by 2080 depending on the future development. The temperature will be much higher in winter (for Rabi crops season) than in rainy season (Kharif crops season).

The Committee also note that Agricultural Nitrous Oxide Greenhouse gas emissions are projected to increase by 35-60% up to 2030 due to increased Nitrogen fertilizer use and increased animal manure production.

The Global livestock-related Methane production is expected to increase by 60% upto 2030. About 2.5 to 10% decrease in crop yield is projected for parts of Asia in 2020s and 5 to 30% decrease in 2050s compared with 1990 levels. Projected changes in frequency and severity of extreme climate events will have significant consequences for food production and food security. Small landholders and subsistence farmers, pastoralists and artisanal fisherfolk will suffer complex localized impacts of climate change. Food trade is expected to increase from developed to developing countries. In India, the agriculture sector contributes 28% of the total

Greenhouse gases, which primarily constitutes the Methane emission from paddy fields, enteric fermentation in ruminant animals.

The Committee are of the view that India will suffer climate change effects of both, the world over changes as well as India's contribution to it through emission of Greenhouse gases. The Greenhouse gases from paddy fields can be reduced, as has been observed by ICAR through its studies, by changing the watering pattern of this crops. By developing high temperature resistant seeds and by converting C<sub>3</sub> plants to C<sub>4</sub> plants and coastal area management.

The Committee also observe that the extreme rise in temperature and emission of Greenhouse gases will be felt only if the conditions remain the same and no efforts are made to mitigate these environmental gases effects. Due to increase in Greenhouse gases, the impact is felt in the areas of temperature rise, sea-level rise, time reduction in crop cycle, yield reduction, migration of fishes to other areas. Cattle breeding and milk production, poultry, irrigation problems, floods, glacier receding, and forests land reduction, etc. However, if the Government rises to its duties to develop strategies at international, national and local levels including Panchayat level, and do agro-climatic zone wise research work to know the ill-effects of global warming in a particular region and develop measures to contain the rise in temperature and to reduce the emission of Greenhouse gases and farmers, self-help groups, fishermen and others at village levels are educated about the measures required to be taken by them to offset the impacts of climate change, increased policy support and financial support from Government of India for agricultural research and establishment of 'Green Research Fund' as envisaged by the Ministry of Agriculture, then the global warming can be contained in an effective manner.

The Committee strongly recommend that DARE/ICAR should develop a drought code, a flood code and a good weather code, at the earliest and should also come out with concrete, constructive and feasible contingency plan for all the agro-climate zones. While preparing drought/flood/good weather code, DARE/ICAR should take care that drought code has comprehensive details of all that needs to be done not only in human rehabilitation and relief but in terms of relief for crops, animals, etc. Similarly, the flood code should explain all that needs to be done in case of floods and good weather code should explain how to maximize crop/allied sectors production in the places where there is good weather. The Committee also desire

that Compensatory Production Programme needed to be developed for agri-allied sectors in case of droughts/floods/climate aberrations, etc. should be expeditiously done with considerable attention and detailed planning based on extensive/intensive/field/anticipatory/adaptation research to be done by DARE/ICAR.

### **REPLY OF THE GOVERNMENT**

DARE/ICAR has a very strong network of research institutions located in different parts of the country which are also working on various aspects of climate change. Further, recently ICAR has established an institute viz. National Institute of Abiotic Stress Management at Malegaon, Maharashtra to address the issues arising due to climate change in terms of abiotic stress on agriculture. The Ministry of Agriculture has already developed a Drought Code with inputs from DARE / ICAR. The suggestions of the Committee will be considered during the revision. Flood Code is being developed by National Disaster Management Authority, under the Ministry of Home Affairs. Good Weather Code will be prepared by DARE/ ICAR incorporating suggestions given by the Committee and interest of the stakeholders.

All the 25 centres of AICRP on Agrometeorology and few ICAR institutes are providing weather based agro advisories (Good weather code) at district level twice in a week to the farming community using the Medium Range Weather Forecast issued by IMD and the current crop conditions. The necessary research back stop in the form of agroclimatic characterization, crop weather relationships, influence of weather on pest/disease for preparing a good weather based advisories and its successful implementations was obtained from the research results generated at the centres of AICRP on Agrometeorology over the last two decades. Utility of crop simulation models to study the impact of various climatic scenarios on crop productivity, development of adaptation and mitigation strategies to meet the threat from climate change have been carried out extensively at AICRPAM centres and also at different ICAR institutes.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Comments of the Committee**

For comments of the Committee please refer to Para No.8 of Chapter I of this Report.

## **National Policy/Action Plan to control and manage Ever increasing Water Logging**

### **(Recommendation Para No.5)**

The Committee observe that the problem of methane emissions get aggravated due to various reasons, such as, (i) Water-logged areas and (ii) Marshy lands, apart from the industrial/agricultural pollutants, etc. The Committee further observe that in many states, Irrigation Department divert the flood waters through canal system to low lying areas. The water logging/inundation make these areas unproductive for months together, especially in Himalayan and Indo-Gangetic Plains and at present there is no clear cut national policy to check and control the contribution of methane emissions by these ever increasing water-logged areas.

The Committee, therefore, recommend that the Government should come out with clear-cut National Policy/Action Plan to check/control and manage (i) Water-logged/inundated areas; (ii) Marshy lands, for Environment/Climate-friendly uses.

### **REPLY OF THE GOVERNMENT**

It is true that water logging is one of the main land degradation problems. Therefore, to reduce the ill effects of water logging and to improve water productivity, models for effective utilization of shallow water logged areas have been developed and demonstrated by ICAR Institutes. These models relate to secondary reservoir system for storing canal / rain/ seepage water for multiple uses and trenches and bed system for productive utilization of medium water logged areas. These systems have been demonstrated to farmers through various training programs organized in collaboration with State Water Resources, Agriculture and Fisheries Department. At the same time, at WTCER, Bhubaneswar, research projects are being conducted on various drainage related studies.

At present, we are studying methane emissions from rice paddies. Non-agriculture water- logged areas and wet lands are generally monitored for methane emissions by Ministry of Environment and Forests and its related organization.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Comments of the Committee**

For comments of the Committee please refer to Para No.17 of Chapter I of this Report.



**Need to develop National Policy/Action Plan to encourage farmers to grow alternate crops along with Paddy Crops**  
**(Recommendation Para No.8)**

The Committee note that agriculture sector contributes 28% in Climate Change and out of that Paddy/Rice cultivation alone contributes 23% by releasing emitting Methane, one of the Greenhouse Gases into the environment and directly contributes to global warming.

The Committee are aware that in many areas of Uttarakhand, Punjab, Haryana, U.P., Bihar, West Bengal, Orissa and other paddy growing areas in the country, farmers are tempted to grow more and more paddy crop, even twice a year, because of the profit motives and has neither the back up knowledge or awareness to grow other alternate crops which can bring them economic prosperity nor has any motivational incentives from the government to grow other than paddy crops, to avoid negative impacts of the paddy cultivation on environment/ climate.

The Committee, therefore, recommends that Ministry of Agriculture should launch a nation-wide awareness campaign for the Indian farmers on watering system of paddy fields and also encourage them to grow other food crops to contain Methane emissions. The Government should come out with a National Policy/ Action plan, agro-climatic zone-wise suggesting/ recommending alternate crops cultivation to bring economic prosperity to the farmers and at the same time avoid rise in global warming.

**REPLY OF THE GOVERNMENT**

Technologies have been developed on efficient water management interventions in rice for reducing the methane emissions. They are being popularized through network centers of All India Coordinated Research Project on Water Management, KVKs and Directorates of Extension of different State Agriculture Universities (SAU) and State Departments of Agriculture. Alternate cropping systems for substituting rice based cropping system have been developed through network Centers of All India Coordinated Research Project on Cropping System for various agro eco-regions of the country. These are being popularized through its network centers.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Comments of the Committee**

For comments of the Committee please refer to Para No.20 of Chapter I of this Report.

### **Need to prevent the Emission of Nitrous Oxides** **(Recommendation Para No.9)**

The Committee note that by 2025 more than double inorganic fertilizers would be essential for producing more food. More forestlands will be converted to farmlands and grasslands. This would lead to more Carbon Dioxide and Nitrous Oxide (GHGs) emissions in the environment. Mitigation is unlikely to occur without; achieving the increase in food production will require more use of Nitrogen Fertilizers leading to further increase in N<sub>2</sub>O emissions and there will be more increase in Methane emissions from enteric fermentation if livestock numbers increase in response to demands for milk, meat and other livestock products. ICAR, at present, has knowledge to prevent only small part of this emission by the use of nitrification inhibitors, slow release fertilizers and integrated nutrient management practices.

The Committee, recommend that ICAR should intensify their research to find out ways and means to further prevent/ mitigate the Nitrous Oxide and Methane gas emissions from application of higher inorganic fertilization and enteric fermentation by increased number of livestock, respectively, to avoid greater harm/ damage to environment/ climate.

### **REPLY OF THE GOVERNMENT**

The Network Programme on Climate Change functional at 23 locations has already initiated research on impact of climatic change variables on crop, livestock and fisheries. Specific examples are research on reducing the enteric fermentation in the livestock through feed management, increasing fertilizer-use efficiency through manipulation of application and placement and reduction in N<sub>2</sub>O losses from the fields using liquid fertilizers through drip irrigation.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

**'Deep Water rice'/ 'Boat Rice' and developing 'Sea Water cultivation' as a science in ICAR/SAU'S**  
**(Recommendation Para No.11)**

The Committee note that there is going to be more flooding in the Indo-Gangetic plains owing to Global Climate Change. From Kanyakumari to Kashmir, from Gujarat to Tripura, rice is the only crop which is grown everywhere: wheat cannot grow because of night temperatures being very sensitive, wheat yield is a gamble in temperature, if the night temperature goes up, the wheat yield will come down. The Committee are aware that already some work is going on in the flood prone areas, which is called 'Deep Water rice or the boat rice'. In Thailand, farmers harvest the rice on the boat and as the water level rises, the plants also grow up.

The Committee, therefore strongly recommend that DARE/ICAR should intensify their research on 'Deep water rice or Boat Rice' and should find out solutions to make Deep Water Rice varieties to be more resistant even in case these are submerged in muddy waters for more than two weeks. ICAR should also do extensive mapping for the likely flood prone areas in wake of global climate change.

The Committee further recommend that DARE/ICAR should undertake 'Sea Water Cultivation' as a science in all their concerned institutes as well as in curriculum of State Agricultural Universities (SAUs).

**REPLY OF THE GOVERNMENT**

Central Rice Research Institute, Cuttack is actively engaged in research on rice growing in different ecologies including flood-prone areas covering deep and semi-deep submergence. For semi-deep areas (~1m submergence), this institute has already released rice variety 'Durga' and some more additional varieties are awaiting release. Regarding 'deepwater rice varieties' (submergence >1m), otherwise known as 'floating rice' or 'boat rice' grown in pockets of UP, Bihar, West Bengal and Kerala, this institute is developing varieties using gene pool of floating rice varieties like 'Jalmagna' and 'Jalnidhi' and the efforts will be further strengthened during the coming years with the development of screening facilities. While this institute per se do not have any research program on 'sea water cultivation', Scientists of CRRRI are also actively engaged in studies on developing rice varieties tolerant to salinity in coastal areas and also developing agro-technology of growing rice crop with brackish

(saline) water irrigation. A research activity under ICAR-IRRI collaborating program on STRASA (Stress-tolerant Rice for Africa and south Asia) is exclusively devoted to refining technologies in the farmers' fields for growing salt-tolerant rice cultivars and also developing alternate rice-based cropping system to enhance profitability of the poor farmers of this handicapped ecology.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

**Dryland Agriculture & Global Warming**  
**(Recommendation Para No.12)**

Since 60% of our agriculture land is rainfed, the focus should be given for improving the techniques for enhancing the productivity of rainfed agriculture. The Committee are of the firm opinion that dryland farming or rainfed agriculture needs special attention to prevent the decline in agricultural produces under climatic changes due to temperature rise. The ICAR should develop the seeds for drought and pest-resistant crop varieties for rainfed area agriculture. Methods for conservation of soil and water of these dryland areas should be undertaken on priority basis. The Government should provide the financial support on easy terms to the farmers of dryland areas to invest in and adopt requisite technologies to tide over the impacts of climate change.

**REPLY OF THE GOVERNMENT**

In terms of research, ICAR is strengthening its efforts to develop drought resistant varieties. At the same time we are advising our research institutes dealing with dryland agriculture such as CRIDA, CAZARI to strengthen their efforts for dryland agriculture in relation to climatic changes.

Provision of financial support to farmers of dryland areas to investigate and adopt requisite technologies to tide over the impacts of climate change is the subject of Ministry of Agriculture/Ministry of Rural Development and other Govt. departments.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

**Need to preserve, conserve and maintain Pedigress/Local Breeds of Livestock (Recommendation Para No.13)**

The Committee observe that there is going to be nefarious consequences of Global Climate Change/Warming on Indian Livestock and Milk Revolution/White Revolution in India which was to a large extent successful because of the cross-bred cows, the Jereys, etc. Since, these cows are extremely vulnerable to high temperatures, it is feared that these cows would slowly become unproductive and there is nothing like returning back to normalcy for these cross-bred cow jeopardizing the success of the White Revolution in India.

The Committee, therefore, strongly recommend that DARE/ICAR should treasure our indigenous cows such as ' Sahiwal', 'Tharparka', 'Rathi', 'Ongole', 'Nellore', etc. and buffalo breeds, like ' Badavari', 'Murrah,' etc. and maintain on priority basis all local breeds which can withstand the heat and vagaries of the climate change and adapt themselves to such local situations without jeopardizing or compromising with the successes of our White Revolution.

**REPLY OF THE GOVERNMENT**

The Indian breeds of livestock have the capacity to withstand thermal stress and water scarcity. Many breeds are resilient to environmental and climatic stress by virtue of their genotype and the capacity to interact with environment. Adaptive mechanism to deal with heat loss are coat colour, skin pigmentation, sweat glands and their secretion, besides the small body size with low energy requirement for maintenance.

The National Bureau of Animal Genetic Resources is engaged in identification, evaluation, characterization and documentation of major and lesser known breeds in different parts of the country and characterize indigenous farm animal breeds both phenotypically and genetically by using molecular techniques. Along with details on the breeds, the parameters on climate are also recorded. A research project is underway aiming to study at the gene level, the different biomolecules involved in the cellular response to heat stress to have an insight into the heat tolerance capabilities of indigenous cattle breeds *Bos indicus* compared to *Bos taurus* cattle breeds. The collected information will be used for identification of livestock breeds having higher capacity to withstand rising temperature and develop adaptation strategies.

To study the impact of climate change on the performance of livestock and poultry, a research programme under network mode with an objective to develop species / location specific THI parameters and the physiological responses of indigenous livestock species including various strains developed has been initiated and research on allele mining for abiotic stress in different species of indigenous livestock and development of molecular markers like heat shock proteins (HSP) has been initiated.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

**Green Research Fund**  
**(Recommendation Para No.17)**

The Committee observe that there is a need to establish 'Green Research Fund' for strengthening research on adaptation, mitigation and impact assessment on agriculture/ allied sectors, of climate change in Indian context. They strongly recommend that DARE/ICAR should come out with comprehensive details/blue print of this 'Green Research Fund' at their earliest and place the same before the Planning Commission/ PM's Council on Climate Change for favourable consideration and implementation and the Committee be apprised of the outcome within three months from the date of presentation of this Report to the Parliament. The Committee are also of the view that along the main beneficiary of this 'Green Research Fund' will be ICAR, yet this Fund should have ample scope and opportunities to encourage and inspire financially the private scientists/NGOs/non-governmental research organizations, institutions, societies, etc. through the nation to put in sincere R&D efforts on the impact assessment of climate change and to come out with feasible adaptive/mitigational remedies for the agriculture and allied sectors.

**REPLY OF THE GOVERNMENT**

A Concept Note on Green Research Fund has been initiated and submitted to all the members of the Multidisciplinary Expert Group of Climate Change constituted by ICAR. A draft document will be prepared soon and submitted for consideration.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Developing Capacity for Undertaking the Real Time Climatic Variability** **(Recommendation Para No.19)**

The Committee note that ICAR requires to share weather data with Indian Metrological Department (IMD) in order to develop capacity for understanding the real time climatic variability on a priority basis and recommend that for achieving the above purpose ICAR and IMD should explore the possibility of signing an MOU in this regard.

The Committee further recommend that in order to generate the right kind of information/data which is critical and wanted, for the ground level beneficiaries such as, farmers, fisherman, livestock managers, etc. on climate variability. Scientists have to go to the farmers and the agriculture experts and ascertain from them about their actual requirements and accordingly should generate the required information on weather conditions.

The Committee also note that several ICAR institutes collect data on crops/livestock/fisheries response to climatic variables. The Committee recommend that this data from different institutes should be compiled, streamlined and put on ICAR Web for greater utilization and understanding impacts of climate change by the farmers and other interested people.

### **REPLY OF THE GOVERNMENT**

A draft MoU for data sharing between ICAR and IMD is under preparation. ICAR has created an Agromet Databank facility and is updating it on regular basis. A website [www.cropweatheroutlook.ernet.in](http://www.cropweatheroutlook.ernet.in) has been created on which weather based agro advisories, crop conditions at weekly intervals, forecast for the next 4 days, rainfall and temperature status over the country, crop contingency plans for various rainfed regions of the country are updated regularly. ICAR is compiling data on crop/livestock/ fisheries response to climate variables and process to bring it in usable form for the farmers and interested target groups which will be put in on its website.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education)  
O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

## **Development of Safe Biotechnological Interventions**

### **(Recommendation Para No.21)**

The Committee observe that one of the item of the National Action Plan on Climate Change is use of Bio-technology. Although the Government has announced that it would set up National Bio-Technology Regulatory Authority, there are lot of controversies and concerns in this regard, particularly, on the agricultural side. There are serious concerns among the masses about the safety aspects of food bio-technology.

The committee, therefore, strongly recommend that DARE/ICAR should intensify and strengthen their research on the generation of the novel genetic combinations, drought, flood, salinity, sodicity and biotic stress tolerant varieties and at the same time they should also develop their capacity to ensure safe and responsible use of bio-technology.

Moreover, DARE/ICAR should review their performance as ICAR is yet to come out with their first indigenous bio-technological breakthrough in agricultural/allied sectors which can be happily and economically grown by Indian farmers to come out of the slavery of imposed monopoly of multinational companies selling them genetically modified seeds at a very high price every time they use their seeds.

### **REPLY OF THE GOVERNMENT**

DARE/ICAR has intensified and strengthened their research on the generation of the novel genetic combinations, drought, flood, salinity, sodicity and biotic stress tolerant varieties. A network project titled “Bioprospecting of genes and allele mining for abiotic stress tolerance” encompassing 35 ICAR institutes, State Agricultural Universities, Universities and other institutions has been sanctioned by NAIP in March 2009. The project will soon become operational (rice, wheat, maize, chickpea, brassica, tomato and banana). In addition, a “Network project on Transgenics and functional genomics” is operational since 2006 and is extended to cover XI plan period. Sixteen transgenic crops expressing various agronomic traits such as resistance to insect pests, diseases, viruses and tolerance to abiotic stresses are being developed. Functional genomics and bioinformatics are being investigated in



few crops. The project is also integrated with safe use of GM crops and their products as tested by various biosafety protocols.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education)  
O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Prevention of Higher Green House Gases (GHGs) Emissions by Food Processing Industries**

#### **(Recommendation Para No.23)**

The Committee observe that Food Processing Industry have been to a large extent dependent on technologies like refrigeration, cold storage, etc. which are abhorred by environmentalists since these technologies are productive of Green House Gases (GHGs).

The Committee visualizing the negative impacts of Global Climate Change on Food Processing Industry recommend that refrigeration/ cold storage technologies based on emission of more GHGs in environment needed to be modified /altered to an extend that no or very low emissions of GHGs go in the air as pollutants to the environment. The Committee further recommend that DARE/ICAR should develop and come out successfully with modified alternative packages for Food Processing Industry as they have an important role in finding technological possibilities an developing varieties of ago-allied produces which can sustain higher temperatures, drought resistant or which can sustain skewed precipitations, etc. for securing a healthy future for our Sun-rising Food Processing Industry.

#### **REPLY OF THE GOVERNMENT**

In view of an urgent need to promote post harvest processing and value addition activities in production catchments, the following technologies are being promoted to reduce the emission of greenhouse gases in post harvest sector, viz., (i) evaporatively cooled storage houses for horticultural produce, (ii)solar dryers for reducing the moisture content to safe storage/ processing levels, (iii) using cleaning/ grading/ packaging in production catchments to significantly reduce the quantity of commodity to be transported to consumers and processing industry, (iv) using crop residues to manufacture packaging boxes and (v) using modified Atmospheric

Packaging (MAP) to minimize the expenditure on refrigeration and thereby reducing GHG emissions. R & D efforts are also being made to continuously refine these technologies.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

**Comments of the Committee**

For comments of the Committee please refer to Para No.31 of Chapter I of this Report.

## CHAPTER III

### OBSERVATIONS / RECOMMENDATIONS IN RESPECT OF WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN VIEW OF THE GOVERNMENT'S REPLY

#### **Need to empowers/equip the State Governments for Mainstreaming the Climate Change factors into various Missions/Schemes in Agriculture Sector** **(Recommendation Para No.4)**

The Committee observe that Rastriya Krishi Vikas Yojana (RKVY) and the National Food Security Mission (NFSM), etc. should be actually prepared and implemented at the district level and at the same time essentially require coordinated/integrated efforts among Ministries of Rural Development, Agriculture, Water Resource, Environment & Forests, Home Affairs and National Rain-fed Authority along with State Government.

The Committee further observe that agriculture constitutionally being a State subject, the State Governments are always reluctant to implement the national missions/schemes of the Centre at the grass root level for reasons, such as lack of funds, technology awareness, appropriate infrastructure, man-power, proper guidance for practical implementation etc.

The Committee, therefore, recommend that if these national missions/schemes as well as National Action Plan on Climate Change (NAPCC) with its eight missions including National Mission for Sustainable Agriculture, are to succeed, then the Central Government Ministries/Departments concerned not only should develop a coordination system with State Governments' authorities /agencies involved in all such mission but also empower them with funds, incentives, technological and management knowledge and skill/guidance, etc., so that, State level implementing authorities/agencies can handle the Climate Change/Global Warming related factors and implement RKVY/NFSM/NAPCC at the district/village level for ultimate success of National Mission for Sustainable Agriculture.

#### **REPLY OF THE GOVERNMENT**

This pertains largely to Centre – State relationships and to National Action Plan for adaptation to Climate Change being coordinated by Ministry of Environment and Forest/PMO.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Right Kind of Trees Plantation for Better Environment/Climate/Water Management**

#### **(Recommendation Para No.6)**

The Committee note that in many Himalayan States planting of wrong varieties of trees in the name of increasing forests cover are rampant in the country. Since climate stabilizes the forests and the forests stabilize the climate, vast denudation of forests and indiscriminate cutting of trees for human greed and needs, are causing greater problems of environment, climate and present day humanity as well. For example, in Uttarakhand, Himachal Pradesh and most of the Himalayan region lot of eucalyptus, devadaru and pines have been grown in huge quantity. Pines are self-pollinated, expanding and multiplying trees. Pines and Eucalyptus have negligible role in climate risk management but rather these trees are well known to cause lots of negative effects to the soil, water and micro-organisms of the area where these are grown. Similarly, in the State of Kerala, under a scheme of growing trees, the States authorities have bought eucalyptus, citorora and other African varieties and planted these trees, as a result, in areas such as Vynad in Kerala where a lot of water was there but owing to citorora and eucalyptus plantation, the water has been drained out. Moreover, even friendly bacteria have been reported to be missing in that soil.

The Committee, therefore, recommend the Central and State Governments to plant only those forest trees that can generate water, oxygen, attract clouds to rain, maintain balance of ecology and also work as non-human climate risk managers to fight flood/drought conditions to help boost our agro-forestry economy. The Non-glacier rivers originate from springs, which can't be saved without thick forest coverage of the areas around their source of origin. The perennial flow of water in these rivers can only save our forests and irrigate food crops in their catchment areas and keep the ill effects of warm-climate at bay.

#### **REPLY OF THE GOVERNMENT**

This pertains to Ministry of Environment and Forests.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

## **Need for Interlinking of the Rivers** **(Recommendation Para No.7)**

The Committee note with serious concern that the majority of the people in the country get affected by frequent floods/ droughts every year. These problems can be overcome to a greater extent by interlinking major rivers and their tributaries in the country and these proposals viz, 'Interlinking of National Rivers' were envisaged about more than 50 years ago and even after the lapse of these proposals still remain pending at the cost of suffering/miseries/pains of the millions of Indian farmers/fisherman/commonmen year after year.

The Committee note that National Water Development Agency established in 1982 under the Ministry of Water Resources to carry out the work of National Perspective Plan for Water Resources Development comprising two components; namely (i) Himalayan Rivers Development; and (ii) Peninsular Rivers Development – to create 35 Mha of additional irrigation potential and generation of 34 million KW of hydropower, had constituted a Task Force on Interlinking of Rivers Programme. Though the Task Force was wound up after giving its recommendations on 31<sup>st</sup> December 2004, however, the process of study and finalization of feasibility reports of 16 link proposals by the affected States, is very slow and no concrete action is seen on the ground for interlinking of these Rivers. The earlier the interlinking process of rivers is completed, it will be easier to manage the flood-waters and river-bed erosions.

The committee, therefore, strongly recommend that the Central/State Governments must execute all the work related to inter-linking of national rivers and their tributaries to divert the excess water which causes floods, to the drought areas on priority basis in the time bound manner and to overcome the problems of frequent floods/droughts as anticipated and already being experienced by the countrymen at large, owing to Global Climate Change.

### **REPLY OF THE GOVERNMENT**

This pertains to Ministry of Water Resources.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

**Climate Risk Managers**  
**(Recommendation Para No.14)**

The Committee note that the Task Force at Climate Risk Managers (CRMs) in all the States & UTs at Districts & local panchayat levels, have potential to be the real saviours of the farmers, Fishermen and other rural folks alike and can play a pivotal role in executing National Action Plan on Climate change at grassroot level.

The Committee further note that the Climate Risk managers till date figure only at conceptual and intellectual levels and still far away from becoming a reality in a professional manner at grassroot level.

The Committee, therefore, unanimously recommend that since the negative impacts of Global Climate Change are ill-affecting and will continue to do so, more intensely in times to come, all the agricultural and allied sectors, it is most essential need of the hour to create and develop a nation-wide Task Force of Climate Risk Managers. These CRM's should be made well versed in prevalent agricultural practices and systems of the areas they have to work/serve in. They should be intensely trained in a professional manner on a host of issues about agricultural and allied sector's activities and have practical knowledge to educate the farmers and local people all about climate change and its impacts with a view to face & help in diverting natural disasters at grassroot level. They should be able to mitigate the sufferings of the farmers, fisherman and common men in the village, due to adverse impacts of Climate change and at the time of floods, droughts, climate variability, natural disaster and technology failure, etc., they should have the ability to convert a disaster into an opportunity for better survival of humanity, as well as flora and fauna of the local areas under their jurisdiction. Since "Climate Risk Managers" are needed at both, village level & block level, they should be able to communicate the strategies required to manage climatic risks on a real-time basis to the farmers. At the same time they should be able to liaise with other related functionaries, including National Disaster Management Authority (NDMA), Indian Meteorology Department and Department of Agriculture and Animal Husbandry, and insurance officials. He/she should be trained in these aspects by the NDMA. Such climate Risk Managers would also be useful at district and state levels to liaise with Government officials and other donor/relief agencies.

The Committee further recommend that in addition to creating an extension cadre of professionals, the Government should train at least one female and one male member in every Panchayat to act as Climate Risk Managers. Moreover, Panchayati Raj Training Institutes in the country should introduce climate related literacy/knowledge and climate Risk/Disaster Management subjects/issues in their own curriculum for training the Panchayati Raj members and others who are coming for training. Ministry of Agriculture should ensure that all their extension workers/whosoever has the responsibility to liaise with farmers, fisherman, and livestock managers, etc. to educate them, must be trained as Climate Risk Managers and each one of them, should have a specific annual physical target to educate and interact with farmers and allied sectors clientele on all aspects of climate Risk management in the area of their jurisdiction.

#### **REPLY OF THE GOVERNMENT**

This pertains to National Disaster Management Authority/Ministry of Agriculture/Ministry of Rural Development. ICAR will be ready to provide technical support in this matter.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

#### **Financial Incentives and packages for improved Land management/Resource Conservation (Recommendation Para No.18)**

The Committee are well aware of the alarming facts/impacts of the Global Climate Change on agriculture and allied sectors in India as well as the endless ongoing sufferings of Indian farmers/fisherman/livestock managers, etc.

The Committee, therefore unanimously recommend that it is high time when the Government of India should make a healthy policy to provide and extend financial incentives and packages to States and UTs to improve land management, natural resource conservation / enhancement, i.e. (water, Energy, Corbon) as well as man-made resources such as equipment/machinery, etc. conservation/enhancement and fertilizer use efficiency to individual farmers, fisherman and livestock managers, etc. who proved to be a successful practitioner in achieving the desired goals. This will really help the individuals and the society as whole to get motivated and encouraged

to indulge in improved management/resources conservation/enhancement and efficient use of fertilizer/resources.

## **REPLY OF THE GOVERNMENT**

This pertains to Department of Agriculture & Cooperation, Ministry of Agriculture.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Bharat Nirman – Irrigation Programme** **(Recommendation Para No.22)**

The Committee note that Irrigation is one of the components for development of rural infrastructure under Bharat Nirman. Ground water irrigation is suffering immensely due to depletion of underground water-table. The irrigation component aims at creation of irrigation potential of 10 million hectare (Mha) in four years, i.e., from 2005-06 to 2008-09. The projects/schemes for creation of irrigation potential are taken up by the State Governments from their own resources according to their priorities.

Government of India has enhanced allocation for grants under Accelerated Irrigation Benefits Programme (AIBP) to provide support to State Governments.

The physical achievements/ progress under Bharat Nirman-Irrigation Component is stated to be 1676.916 thousand hectare for the year 2005-06; 1943.346 thousand hectare for 2006-07; and 1522.394 thousand hectare for 2007-08. It is evident from these figures that about less than 50 percent target has been achieved in initial three years and in the last/final year, i.e., 2008-09, more than 50 per cent target is left to be achieved.

The committee, therefore, strongly recommend that it is high time to develop right kind of strategies and action plan, reviewing the past performance, to convert the big failure of irrigation component of Bharat Nirman into a bigger success in wake of man-made Global Climate Change.

## **REPLY OF THE GOVERNMENT**

This pertains to Ministry of Water Resources

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*



**CHAPTER IV**

**OBSERVATIONS / RECOMMENDATIONS IN RESPECT OF WHICH ACTION  
TAKEN REPLIES OF THE GOVERNMENT HAVE NOT BEEN ACCEPTED BY THE  
COMMITTEE**

**- NIL -**

## CHAPTER V

### OBSERVATIONS / RECOMMENDATIONS IN RESPECT OF WHICH FINAL REPLIES OF THE GOVERNMENT ARE STILL AWAITED

#### **National Climate and Water Management Policies** **(Recommendation Para No.2)**

The Committee note that the negative impacts of Global Climate Change on Agricultural & allied Sectors and on natural resources/water availability, etc. are enormous. The negative impacts of climate change / global warming will be terrible on Himalayan Glaciers / Rivers / Water availability, frequent, floods/droughts phenomenon.

The Committee learnt during evidence and on the spot Study Visits to Himalayan States that the Ministries of (i) Agriculture, (ii) Environment & Forests and (iii) Water Resources, etc. which are responsible for giving guidance to the Himalayan States, lack the positive approach/attitude towards these States/areas. These Ministries are mostly said to be telling only about don'ts and hardly explain about the do's and other positive things to the policy makers/implementing agencies at the States' level and at the level of the farmers and common people/other stakeholders engaged in the agrarian & allied sectors activities.

The Committee further observe that there is certainly lack of coordination and interaction between Central Government and State Governments of Himalayan States. The Committee, therefore, unanimously recommend that Central Government through their Ministries/Departments should immediately take necessary initiatives to associate the Himalayan State governments with all schemes and programmes related to Global Climate Change, its implications and solutions. These States should have an active role to play in National Action Plan on Climate Change/Water management practices implemented at State/grassroot level. They should actively participate in National Policy on Climate Management. The Central Government should help these State Governments financially and technically for better implementation of the Climate Control Policies/Action Plans.

The Committee note that agriculture is the backbone of our food security. Out of 75 million persons added world over to the 'Hungry' during 2007, over 30 million

are from India. Since the problem of climate change is a current living reality, the Committee observe that Central and State Governments and their Departments have not learnt lessons from recent year's floods, droughts, high temperatures and changes in sea level, etc. due to climate change, as neither tsunami affected nor recent Kosi river floods' affected human beings have been found rehabilitated after the floods receded. The Government machineries have not been able to give sufficient help to rehabilitate the agriculture and allied activities of the affected areas. The frequent droughts/floods and other impacts of Global Climate Change on Agriculture can change the face of the Indian economy for worse.

The Committee, therefore, recommend that Ministry of Agriculture and all other concerned Central Ministries/Departments should make coordinated efforts to find solutions to the floods/droughts/high temperature/climate variations etc. for the ultimate welfare of the homo-environ systems of the country.

### **REPLY OF THE GOVERNMENT**

This pertains to Department of Agriculture & Cooperation, Ministry of Agriculture and Ministry of Environment and Forest/ PMO as well as other Central Ministries.

The ICAR is strengthening its research activities through the Network Project on Climate Change during the XI<sup>th</sup> plan. It has already established a National Institute of Abiotic Stress Management at Baramati, Maharashtra and is in the process of establishment of another institute dealing with Management of Biotic Stress.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Comments of the Committee**

For comments of the Committee please refer to Para No.11 of Chapter I of this Report.

### **Mass-Spreading of Climate Literacy and related Missions/ Programmes and among the Farmers/Commonmen**

#### **(Recommendation Para No.3)**

The Committee note with serious concern that the Climate Change and global warming extension services are at the lowest level among the farmers, people

engaged in animal husbandry, fishery sectors and other stakeholders involved in agricultural and allied sectors.

The Committee observe that this poor awareness of the knowledge about the legal issues, rights and environmental or climate change and its negative impacts on agro-economic life and things to be done at grassroot level to overcome the negative impacts of climate change, not only create mistrust and misunderstanding among the farmers, fishermen and the Government authorities and private agencies, involved in implementing/ executing the action plan, etc., but also generate strong opposition / objection from the masses/State Governments towards the Central laws or National Action Plans. With the result, it becomes extremely difficult to implement those laws or action plans which are designed and created for the ultimate welfare of the farmers, fishermen and other affected people, as happened with the recently announced notification of the Integrated Coastal Zone Management (ICZM). Almost all the State Governments and their coastal population are objecting to it saying the Coastal Zone Management is going to harm the fishermen, farmers and their livelihood and their lands may be taken away by some rich people. Thus, a law or scheme/plan which intend to protect them, get objections just because there is not enough legal, climate and environment literacy and awareness among farmers, fishermen and commonmen of the coastal areas.

Even if one goes to any tribal village or remote rural area, people there do not know about the Farmers' Rights Act or Biodiversity Act or the National Action Plan on Climate Change. So this lack of legal/enviro/climate literacy among commonmen has become a serious shortcoming in getting the positive outcome from such Acts and National Action Plans in the country.

The Committee, therefore, strongly recommend that all the Central Ministries & their Departments and other Government agencies should take initiatives and make sincere efforts to inform, educate and propagate about the climate change with all its positive and negative aspects, among the farmers, fishermen and commonmen, only then any action taken or intended to be taken against global warming by the Central/State Governments will be successful.

## **REPLY OF THE GOVERNMENT**

The importance of creating awareness about the weather and the positive and negative aspects of climate change among the farmers has been well recognized by

ICAR. Through its coordinating projects on Agrometeorology and Dryland Agriculture, a mass awareness campaign on climate change was conducted during October 2008 at 37 research centres of both the projects. Farmers were exposed to the measurement of weather parameters in the observatory and their influence on agricultural crops. The feed back obtained from the farmers about their knowledge on importance of different weather parameters was quite interesting. About 70-80% of farmers have some knowledge on the importance of weather elements on the incidence and spread of pest/diseases. This programme will be continued in each year. The current weather based agro advisories became popular among the farming community, and the climate this awareness programme shall also benefit the farmers in understanding and managing the weather resources properly for sustainable agricultural production.

As a part of collaborative programme between ACIAR, ANGRAU and CRIDA the Agrometeorologists at CRIDA, Hyderabad have participated in training farmers of Warangal and Mahabubnagar districts in Andhra Pradesh during 2008-09 seasons in utilizing the forecast issued by IMD and also the agro advisories for managing the agricultural crops efficiently for higher productivity.

From the research results of various centres of AICRP on Agrometeorology over the last two decades, developing optimum weather indices at different important crop stages that influence the overall productivity is in progress. These indices shall help in developing weather insurance products that protects from the farmers against climatic risks such as high intensity rainfall, heat and cold waves, drought etc.

At the same time we are advising all our research institutions and SAUs to take up this awareness programme in their respective areas for farmers and other stake-holders.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

#### **Comments of the Committee**

For comments of the Committee please refer to Para No.14 of Chapter I of this Report.

### **Impacts of Climate Change on Agriculture/Allied Sectors due to Sea Level Rise (Recommendation Para No.10)**

The Committee note that IPCC recently in their assessment report has pointed out that modern global warming could melt glaciers and raise world sea level by 0.18 to 0.59 meters by 2100. If such rise in the sea level and rise in high-tidal level, cyclones and storms takes place in India, with a coastline of 7500 kms, impacts on the livelihood of coastal communities will be considerable. But from agricultural perspectives, not many studies have been done in India by ICAR. However, it is expected that vast stretches of coastal lands may get submerged, making them unsuitable for upland crops and increased salinity in aquifers may lead to reduced crop production in coastal lands, and fish production will also get affected.

The Committee, therefore, recommend that DARE/ICAR should gear up their research efforts on all the pros and cons of the impact of climate change on all the agriculture & allied sectors due to rise in sea level. Its impacts on the agro-economic life of farmers/fisherman, etc. should also be studied with practical & feasible solutions/remedies. Development of salinity –tolerant crop cultivars should be given priority. The fishermen should get timely and advance forecasting about weather and cyclone in the high seas.

The Committee also recommend that Government should give more attention towards coastal forests & mangroves. Building public awareness and other extension programmes on various aspects of climate change in vernacular language is the need of the hour.

### **REPLY OF THE GOVERNMENT**

In order to cope up with the intrusion of sea waters in to the low lying coastal regions of the country due to rise in sea level, research on development of salt resistant varieties that can come up well under salt affected soils are in good progress at CSSRI, Karnal and also at CRRI Cuttack. Under the Network Programme on Climate Change CMRFI, Kochi is studying the possible impact of climate change on the migratory behavior of different fish species of economic importance and also conducting experiments on the physiological changes that are likely to occur due to increase in sea surface temperature and salinity. CMRFI, Kochi in association with Indian National Centre for Oceanic Information Service (INCOIS) is participating in issuing advisories to the fishermen on the fish abundance regions in Arabian Sea.

The ministry of Environment Forest and few NGOs like MSSRF have taken up mass campaign programmes among the people living in the coastal regions about the importance of mangroves in the coastal ecosystem and the need to protect the mangroves, a measure against threats from Tsunami, tidal waves associated with severe cyclones and increase in the mean sea level and subsequent inundation of low lying region.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Comments of the Committee**

For comments of the Committee please refer to Para No.24 of Chapter I of this Report.

### **Intensify the R & D on Climate Change (Recommendation Para No.15)**

The Committee note that climate change is likely to impact negatively on many aspects of agriculture, including, irrigation availability, soil health, pests and crops and livestock production. Preliminary calculations to quantify the decrease in production of wheat suggest a likely decrease of 4 to 5 million tones with an increase of 1°C increase in temperature throughout the growing season. ICAR stated that work on other crops is being done and at present, comprehensive estimates of costs of abating these damages due to climate change has already started on Indian agricultural sectors.

The Committee recommend that DARE/ICAR should expedite and intensify their research and development work on all the major food grains, coarse grains, pulses, cash crops, oilseeds, horticultural/medicinal and aromatic plants, tuber and fodder crops, etc., with regard to likely negative as well as positive impacts of climate change and should also come out successfully with remedial solutions/ packages/ technologies/ practices which can be conveniently and feasibly practiced and adopted by all the Indian farmers/ livestock producers in all the agro climatic zones of the country. Agriculture should be supported by the convergence of traditional practical knowledge of the farmers about the farming system and new technological innovations, biotechnology and in case of failure of the crops effective insurance mechanism need to be created.

The Committee also recommend that DARE/ICAR should take expeditious steps to work out the comprehensive estimates of costs/funds required to abate the challenges emerging out of climate change scenario as has been done by many other countries.

### **REPLY OF THE GOVERNMENT**

DARE/ICAR is giving more emphasis on research related to developing adaptation and mitigation strategies to cope up the likely effect of climate change for various agro-climatic zones of the country. Decision support systems and weather insurance products for managing climatic risks, drought/ heat resistant varieties are also being developed at ICAR institutes. ICAR has already initiated work for preparing estimates of costs/funds required to abate the impacts of climate change.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

### **Comments of the Committee**

For comments of the Committee please refer to Para No.28 of Chapter I of this Report.

### **Research Grants to DARE/ICAR** **(Recommendation Para No.16)**

The Committee note that ICAR has initiated research and development programmes on several aspects of global climate change impacts on crops/livestock/fisheries, etc. The Committee are of the view that the pace of ICAR research is not satisfactory and is very slow. This snail pace progress can be accelerated only if the grants for climate change research are enhanced.

The Committee, therefore urge upon the planning Commission/ PM's Council on Climate Change/Ministry of Finance to help ICAR to accelerate their pace by doing useful R&D on the impacts of climate change by immediately providing more grants to them to put an end to unending sufferings of the Indian farmers/fisherman/livestock keepers, etc. The Committee also advise the DARE/ICAR to make their comprehensive estimates of funds/grants requirement and place the same before Planning Commission/PM's Council on Climate Change for a/meetings for help in getting the approval of the funds for their research on climate change impacts on agriculture & allied sectors.



## **REPLY OF THE GOVERNMENT**

ICAR has strengthened its research efforts by increasing the number of Centres from 14 to 23 in the Network Project on Climate Change and by increasing their budget allocation in the 11<sup>th</sup> Plan. At the same time several research institutes have intensified their efforts to develop heat/drought tolerant varieties. The ICAR has also established a National Institute on Abiotic Stresses at Barmati to address these challenges related to abiotic stresses. A National Institute of Biotic Stresses is also proposed to be established in the 11th Plan.

For additional grants, ICAR has already submitted a proposal to the Prime Minister's Council on Climate Change.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education) O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

## **Comments of the Committee**

For comments of the Committee please refer to Para No.28 of Chapter I of this Report.

## **Making the Society and Economy Climate Proof** **(Recommendation Para No.20)**

The Committee note that Climatic variability has always been an important issue in Indian Agriculture. It has caused frequent events of droughts, floods, heat and cold stresses, causing widespread impact on food production. Climate Change is likely to increase such risks in future. Although ICAR and State Agricultural Universities (SAUs) are reported to have always taken this issue of 'Climate Proofing' seriously yet, they have no comprehensive estimates of costs associated with making our Society and Economy 'Climate proof'.

The Committee, therefore, recommend DARE/ICAR to understand the gravity of the negative impacts of Global Climate Change on Agriculture and Allied Sectors. It should come out with comprehensive estimates of costs and best management practices for making our agro-socio-economy climate proof at the earliest as this will help the research institutions to get the required funding from the MoF/Planning Commission. Such comprehensive estimates of costs will also help the appraisal agencies to allocate funds appropriately among various Ministries/Departments

considering the priority of the issues/matter involved. This will also help the Central Government to negotiate India specific concerns with the various international financial institutions/agencies who can be instrumental in helping us with required funding to combat the whole issue of Global climate Change in its totality.

#### **REPLY OF THE GOVERNMENT**

Reply in respect of cost / fund is already provided in Recommendation No.15.

*[Vide Ministry of Agriculture (Department of Agricultural Research and Education)  
O.M. No.7(1)/2009(Pt.) dated 15 September, 2009]*

#### **Comments of the Committee**

For comments of the Committee please refer to Para No.28 of Chapter I of this Report.

**NEW DELHI;**  
**20 May, 2010**  
**30 Vaisakha, 1932(Saka)**

**BASUDEB ACHARIA**  
***Chairman,***  
***Committee on Agriculture***

**COMMITTEE ON AGRICULTURE  
(2009-10)**

**MINUTES OF THE THIRTY FIRST SITTING OF THE COMMITTEE**

The Committee sat on Monday, the 17 May, 2010 from 1500 hours to 1655 hours in Committee Room 'C', Parliament House Annexe, New Delhi.

**PRESENT**

*Shri Basudeb Acharia - Chairman*

**MEMBERS**

***Lok Sabha***

2. Shri Narayan Singh Amlabe
3. Shri Thangso Baite
4. Shri Jayant Chaudhary
5. Smt. Ashwamedh Devi
6. Shri Anant Kumar Hegde
7. Shri Prabodh Panda
8. Shri Premdas
9. Shri Nripendra Nath Roy
10. Shri Bhoopendra Singh
11. Shri Hukmdeo Narayan Yadav

***Rajya Sabha***

12. Shri Narendra Budania
13. Shri Satyavrat Chaturvedi
14. Shri A. Elavarasan
15. Shri Sharad Anantrao Joshi
16. Shri Mohd. Ali Khan
17. Shri M. Rajasekara Murthy

**SECRETARIAT**

1. Shri S. Bal Shekar - Joint Secretary
2. Shri P.C. Koul - Additional Director

2. At the outset the Hon'ble Chairman welcomed the members to the Sitting of the Committee. Thereafter, the Committee took up the Draft Report on Action Taken by the Government on the Observations/Recommendations contained in the Forty-seventh Report (Fourteenth Lok Sabha) of the Committee on Agriculture (2008-09) on 'Impact of Global Climate Change on Agriculture and Allied Sectors in India'. After some discussion,

the Committee adopted the Draft Report. Being inter-session, the Committee also authorized the Chairman to finalise the Report and present to the Hon'ble Speaker, Lok Sabha and Chairman, Rajya Sabha.

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6.           \*\*\*\*           \*\*\*\*           \*\*\*\*           \*\*\*\*

A verbatim record of the proceedings has been kept separately.

***The Committee then adjourned.***

## ANNEXURE

(Vide Para 4 of Introduction of the Report)

### ANALYSIS OF ACTION TAKEN BY GOVERNMENT ON THE FORTY-SEVENTH REPORT OF COMMITTEE ON AGRICULTURE (FOURTEENTH LOK SABHA)

(i)	Total number of Recommendations	23
(ii)	Recommendations/Observations which have been Accepted by the Government	
	Serial Nos. 1, 5, 8, 9, 11, 12, 13, 17, 19, 21 and 23	
	Total	11
	Percentage	47.82 %
(iii)	Recommendations/Observations which the Committee Do not desire to pursue in view of the Government's replies	
	Serial Nos. 4, 6, 7, 14, 18 and 22	
	Total	6
	Percentage	26.08 %
(iv)	Recommendations/Observations in respect of which replies of the Government have not been accepted by the Committee	
	Total	NIL
	Percentage	0%
(v)	Recommendations/Observations in respect of which Final replies of the Government are still awaited	
	Serial Nos. 2, 3, 10, 15, 16 and 20	
	Total	6
	Percentage	26.08 %