

# **Integrated Management of Natural Resources for Food, Water and Livelihood Security in the Rainfed Areas of India**

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Food security and enhanced farm income is the supreme national mission for any government in the country beset with the problem of burgeoning human population and constrained productivity of the agriculture lands due to gradually depleting ground water resources, soil degradation, denudation & degradation of forestlands, etc. and resultant perpetuation of the vicious cycle of poverty-degradation. The problems of land and environmental degradation are multiplying and compounding with the climate change. To augment the agriculture productivity, the focus of the government is on the development of rainfed area of the country, including 75 M hectare forestlands whose productive potential needs to be harmonized sustainably in an integrated manner.

About 60% net sown area in India is rainfed, risky, complex, diverse, fragile, under-invested and highly vulnerable to climate change and contributes 40% to the food-grain production and support 40% population. The average food-grain productivity of predominantly irrigated States is about 3 tonnes per ha compared to about 1 tonne per ha under rainfed conditions. Productivity of 100% grazing and forest lands and rain-dependent 80% area under fruits is also low.

The forests, pastures, agriculture crops, rocks containing minerals, air, water bodies nurturing fisheries & power, lands, soils, etc. all form various natural resource systems. Many of these resource systems are interlinked and responsible for the other production systems and also some of the life supporting resources.

Forests are repository of the bio-diversity, gene pool resources, sequester carbon and provide lot of other environmental services. They play a very vital role in sustaining the life of people and are crucial for the food and water security. In India, the sustained flow of water in our rivers, streams and rivulets and recharge of ground water is necessary for the food security and drinking water availability. The hydrological functions of forests include interception of rainfall and regulating the stem flows, binding soil to prevent soil erosion and conserving the soil moisture. Thus, forests are the source of major water resources both surface, subsoil and ground water in the country. Forests supply nutrients to agriculture crops through runoff water with much other complementariness with agriculture ecosystem.

The National Rainfed Area Authority (NRAA), a multi-disciplinary inter-ministerial body, has been created at the behest of the Hon'ble Prime Minister to harness and harmonize tremendous productive potential of the rainfed areas by converting weaknesses into strengths and threats

into opportunities by appropriate policies, programmes, professionalism and capacity building and also to provide policy back up to five line departments to promote **Out of Box solutions** mandated to diversify the agriculture production and income of farmers while ensuring ecological stability and availability of water for sustainable agriculture for adoption in large scale.

### **Mandate of NRAA:**

- Prepare a perspective plan for holistic and sustainable development of rainfed areas.
- Evolve Common Guidelines for all schemes of different Ministries including EAPs.
- Coordinate and bring convergence within and among agriculture and wasteland development programmes being implemented.
- Identify rainfed areas in different States, which need priority attention and prepare watershed development programmes focusing on multi-dimensional crop, livestock, horticulture, agri-pasture, integrated systems and programmes.
- Identify gaps in input supply, credit availability, dissemination of appropriate technology and other requirements.
- Guide implementing agencies on priority setting and monitor the specific interventions required.
- Develop plans/programmes for capacity building of centre/State Government functionaries.
- Suggest modalities to strengthen National and State level institutions and establish institutional linkages.
- Monitor disbursement of rural credit/insurance cover/safety net programmes developed.
- Set the research agenda including a critical appraisal of on-going programmes and promote diffusion of required knowledge for integrated farming.
- Evaluate the effectiveness of completed watersheds and concurrent evaluation of on-going programmes.

### **2. Achievements of NRAA:**

The establishment of NRAA has been made with the approval of Union Cabinet with an initial annual outlay of Rs.3.5 crores. Only during the year 2006-07, the initial expenditure on setting up of NRAA was met from the WDC Scheme of DAC. A provision of Rs.1.5 crores was made for the year 2007-08 with a dedicated budget head for NRAA. During 2008-09, an allocation of Rs.4.00 crores was made. The Central Sponsored Scheme on National Rainfed Area Authority (NRAA) has been approved by the Government on 01<sup>st</sup> May, 2009 with an outlay of Rs.123 crores over the XI<sup>th</sup> Plan.

Since EFC of NRAA scheme has been approved by Ministry of Finance, Government of India on 1<sup>st</sup> May, 2009 and various activities/Pilot Studies as per approved programme have been initiated by NRAA, therefore, proposal for revised allocation of Rs.13.25 crores during the current financial year has been submitted to Department of Agriculture and Cooperation for consideration/approval by Planning Commission. The progress made by NRAA in different activities is given as under:

**(I) Perspective Plan and Priority Setting for Rainfed Areas:**

- (i) The Detail Format for the preparation of Perspective Plan for Rainfed Areas and a Technical Publication on **“Harnessing Opportunities in Rainfed Areas- A Pathway to prosperity Vision 2025”** has been circulated to all States for the preparation of State Perspective Plan-2025. States are being facilitated to prepare Perspective Plan. State Level Workshop in the States of Maharashtra, Gujarat, Tamil Nadu, Karnataka and Tripura have been organised in this regard. The State of Uttrakhand has prepared the Perspective Plan and sent to NRAA, while others are in progress. Perspective Plan workshops for Jharkhand, Meghalaya and other states will be held shortly. For facilitating the preparation of State specific Perspective Plans, Process guidelines, DPRs, action has been initiated to hold workshops/ interactive meetings in all the states.
- (ii) Prioritization of Rainfed Areas is the main activity under the component of Perspective Plan and Priority Setting to be carried out by NRAA as per approved EFC on the Central Sector Scheme “National Rainfed Area Authority” for the 11<sup>th</sup> Plan. The issue of prioritization of Rainfed Areas was deliberated in the National Seminar on **“Prioritisation of Interventions in Rainfed Areas for Sustainable Livelihoods jointly held by NCAP-NRAA on 23<sup>rd</sup>-24<sup>th</sup> April, 2009”**. It was recommended in the seminar that immediate steps need to be taken by NRAA for undertaking the prioritization of Rainfed Areas by integrating socio-economic and livelihood indicators together with runoff harvesting potential, production/ yield gaps and natural resources availability by involving institutions engaged in rainfed areas, socio-economics and livelihood aspects. NRAA has awarded the study to Central Research Institute for Dryland Agriculture (CIRDA) on prioritization of Rainfed Areas in the country with estimated cost of Rs. 19,10,120/-. The

study will be carried out by CRIDA in association with IASRI and input from State Governments.

- (iii) **“Harmonization of Wastelands/ Degraded Lands Data Sets of India”** has been documented in collaboration with ICAR, NRSA and NAAS. The state-wise information on wasteland and rainfed area given in the document will help planners, administrators, decision makers and fund managers of land based development schemes and watershed programmes in identification of area, approval and sanction of projects in rainfed and wasteland/ degraded land areas.

## **(II) Implementation of Common Guidelines**

The common guidelines were approved in the second Governing Board Meeting of NRAA on 11<sup>th</sup> February, 2008 and have become effective from 1<sup>st</sup> April, 2008. A National workshop on “Common Guidelines for Watershed Development Projects” was organised on 5<sup>th</sup> August, 2008 at New Delhi for sensitization of Senior Officers from State Governments. A National level workshop for sensitization of NGOs on Common Guidelines was also organised as one of the collaborators with WASAN in September, 2008 at New Delhi. The process of holding State level workshops for sensitizing the Officials of States for implementation of Watershed Programmes as per the ‘Common Guidelines – 2008’ has been completed in all the major states of the country and **‘Common Guidelines for Watershed Development Projects’** published by NRAA has been circulated to all Stake holders. NRAA has been actively engaged at facilitating formation of State Level Nodal Agencies (SLNAs) and implementation of Common Guidelines in the states through regular guidance and participation in SLNAs meetings in various states .

## **(III) Convergence of different resources innovatively and initiation of Pilots**

NRAA has initiated the process of following pilot studies for developing and demonstrating consortia of institutions for upgrading rainfed areas in high priority/distress prone regions:

- (i) ***Livestock Centric Interventions for livelihood improvements in arid regions of India – Nagore district in Rajasthan.***

The Pilot Study on ‘Livestock Centric Interventions for livelihood improvements in arid regions at Nagore district in Rajasthan’ will be implemented in a consortia mode involving

Rajasthan Livestock Development Board, Central Arid Zone Research Institute, Jodhpur and NGOs. The cluster approach would be followed. Four clusters with an average size of one thousand household would be taken up for study. The major objectives of the study would be as under:

- Develop appropriate livestock production system(s) in a cluster approach.
- To re-orient crop production systems in the study area for enhanced biomass production for livestock feeding.
- Develop appropriate water conservation measures for increased water use efficiency.
- Improvement of common grazing areas/ community lands with innovative approaches.
- To provide value addition and suitable market linkages for livestock products to ensure remunerative prices

Rajasthan Livestock Development Board would primarily focus on health coverage, breeding aspects, convergence of various GOI and states schemes, and also provide the logistic support in the area of operation. CAZRI, Jodhpur would be providing the necessary technical support in various activities, evolve and implement suitable crop pattern in the area and undertake promotion and propagation of spine less cactus as live stock feed. The Community mobilization and socio-economic studies will be carried out by NGO.

**(ii) *Pilot Project for capitalizing opportunities of rice fallows in Eastern India for sustainable livelihood development.***

The project is proposed to be implemented in a consortia mode involving State Governments, SAUs and reputed local NGOs with the State Government at Nodal Agency in the State of Jharkhand and Chhattisgarh. The overall goal of this project is to contribute to agricultural growth and increase farm productivity, income and employment in order to augment food security and reduce poverty as well as improving the natural resource conservation in the rice fallow areas through optimization of the introduction of a second crop in the rice system. The specific objectives of the project are:

- Evolve and pilot test the promotion of production/ farming system focused at second crop/alternate

livelihood interventions in the rice fallows of Eastern India.

- Develop and demonstrate convergence to support the systems perspective and a workable institutional mechanism for holistic development of rice fallows.
- Provide new in-sights for next generation comprehensive rainfed area development/watershed programmes and identify the enabling policy options for sustainable development of rice fallows.
- Increase the capacity of the developmental agencies and partners through joint collaboration and experience sharing.

The Concept note has been prepared after the joint visit of NRAA, International Centre for Agriculture Research in Dry Area (ICARDA), Syria and State Government officials in the state of Jharkhand and Chhatisgarh. The NRAA is in the process of awarding pilot study in the states of Chattisgarh and Jharkhand.

***(iii) Pilot Study on management of fringe-forests and adjoining non-forests lands for ecological, water, food and livelihood security and sustainability of JFM Programme.***

The project is proposed to be implemented in a consortia mode involving State Governments, a research institution and reputed NGOs with the State Forest Department at Nodal Agency. The pilot project is to be implemented in five regions namely *Western Himalayas, Central Highlands, Eastern & Western Ghats and North Eastern Hills* of the country. The overall goal of this project is to optimised management of the fringe forests and adjoining non-forestlands for demonstration and pilot management of fringe forest areas for integrated and holistic management of natural resources. The specific objectives are:

- Integrate land based activities of agriculture, animal husbandry, forests and rural development for holistic development of fringe forests and adjoining non forestlands.
- Development of mechanisms for convergence of resources, activities and programmes to demonstrate win-win situation for upstream forest and downstream agricultural areas for ecological, water, food and livelihood security.
- Ensure better ecology and conservation of native biodiversity for adaptation to climate change response and carbon sequestration.

- Enable village institutions to develop and promote micro and medium enterprises for enhanced livelihoods of marginal and medium farmers, asset less, women and venerable sections of the society through development, promotion, value addition and processing of locally available natural resources.
- Enhance capacity of forest departments and other developmental agencies and NGOs through joint collaboration and experience sharing.

NRAA is in the process of awarding Pilot study in the states of Chattisgarh, Uttrakhand and Tripura.

#### **(IV) Research & Subject matter Studies Setting Research Agenda for Development of Rainfed Areas**

The following research and subject matter studies have been initiated by NRAA:

**(i) *Study on water use sustainability vis-à-vis food grain production in the states of Punjab, Haryana and Uttar Pradesh.***

The study is proposed to be conducted in the state of Punjab, Haryana and Uttar Pradesh through independent agency. NRAA is in the process of finalizing the study to be awarded to Independent Agency.

**(ii) *Study on experiential learning from Vidarbha Rehabilitation package.***

This field study has already been initiated and brief note based on preliminary visit has been submitted. Detailed field visits are being planned.

**(iii) *Study on identification of extent of forest lands in the forests fringe village watersheds.***

This study is planned to be carried out during XIth Plan period. NRAA is in the process of finalizing the study to be awarded to Independent Agency.

**(iv) *Status paper on food security, water and energy nexus in India.***

NRAA has prepared a '**Status Paper on Food Security, Water and Energy Nexus in India**'. This would help in making effective policy for holistic development of

rained areas by enhancing agriculture productivity and reducing poverty. NRAA will organize awareness campaign in making effective policy for holistic development of rainfed areas with all stake holders.

#### **(V) Capacity Building of Manpower**

NRAA has initiated the process of training programme for sensitization to Senior Officers/Manager on emerging watershed paradigms and training on the preparation of Detailed Project Reports on watershed to Middle and Junior Level Officer to strengthen the capacity building of the manpower/organizations in the states. Based on experience, reputation, geographic location and strengths of organizations in Watershed Programmes, empanelment of few resource organizations have been done to undertake immediate capacity building activities. The training scheduled has been finalized for the states of *Andhra Pradesh, Himachal Pradesh, Karnataka, Madhya Pradesh, Gujarat, Tamil Nadu and Uttrakhand*. The schedule of capacity building programme in remaining states is also being finalized. States have been approached for preparation of Technology Manuals. Based on the proposals received from the states the Technology Manuals will be developed in a consultative mode.

#### **(VI) Monitoring & Evaluation of Effectiveness of Program.**

##### **(i) Impact Evaluation Studies for assessing the impact of NWDPRP Programme in 108 selected watersheds treated during 10<sup>th</sup> Plan in different states representing 6 zones by independent evaluation agencies:**

National Rainfed Area Authority has awarded contract to six independent evaluation agencies for assessing the impact of NWDPRP Programme in 108 selected watersheds treated during 10<sup>th</sup> Plan at a total cost of Rs.108,84,417/- in different states representing 6 zones:

##### **(ii) Monitoring and Evaluation of groundwater utilization and recharge programmes:**

The monitoring and evaluation of groundwater utilization and recharge programmes will be taken up in 146 identified districts in 7 states viz *Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan and Tamil Nadu* in phase manner. Initially, the monitoring and evaluation study on effectiveness of artificial recharge of ground water programme/schemes/projects in

the rainfed regions of Maharashtra has been taken up. The study has been awarded to M/s. WAPCOS Ltd. For conducting Monitoring and Evaluation of groundwater utilization and recharge programmes in the states of Maharashtra.

- (iii) NRAA took the lead in spearheading Inter-Ministerial Task and prepared a Report on Drought Mitigation Strategy for Bundelkhand Region of Uttar Pradesh and Madhya Pradesh.
- (iv) The scheme of Rainfed Area Development Programme submitted by RFS Division of Department of Agriculture & Cooperation, MoA was reviewed and comments were offered for its improvements.
- (v) NRAA has made contribution in reviewing various Flagship Schemes of Government of India such as NREGA, C-DAP and planning process for preparing District plans, in states like Haryana, Punjab, Andhra Pradesh, West Bengal and Rajasthan.
- (vi) Technical Expert (WD) of NRAA visited districts of Bankura, Purulia and West Medinipur of West Bengal to ascertain short term and long term developments as part of the team constituted by PMO and submitted a detailed report for development of rainfed agriculture and watershed in the above districts.

#### **(VII) Setting up of National Level Data Centre & National Portal:**

Action has been initiated and discussions were held with ISRO, Bangalore Centre. As per detailed discussion, they have submitted a concept note/base paper for the National Level Data Centre & National Portal. A meeting has been organized with NIC and ISRO, Bangalore Centre to work out the further modalities.

#### **(VIII) NRAA' Publications/Bulletins**

- (i) A Position Paper on "**Rainfed Livelihoods: Progressive Paradigms**" has been published. The publication harmonizes, synthesizes and converge a chain of interventions from rainwater conservation to sowing, harvesting, marketing, aggregation, value addition and managing residues.
- (ii) A Policy paper on "**Soybean based farming systems for improving livelihood of rainfed areas**" has been published.

- (iii) For understanding the reasons for stagnation in growth and examine various issues involved for successful implementation of **Primary Producer Companies (PPCs)** as alternate institutional mechanism, a case study was made of Indian Organic Farmers Producer Company Limited, Kochi, Kerala. A printed report of the study made has been brought out.
- (iv) A booklet entitled "**Hiware Bazar – An experience in integrated natural resource management**" documenting the success story of interface between forest and non-forest land use has been published.
- (v) Technical Publication on "**Harnessing Opportunities in Rainfed Areas- A Pathway to prosperity Vision 2025**" has been circulated to all States for the preparation of State Perspective Plan-2025.
- (vi) A success story on ITC Case Study- '**Farmer-Industry Partnership for Diversified Livelihood and Raw Material Production**' has been published by NRAA in May, 2009.
- (vii) **Drought Management Strategies-2009**: CEO, NRAA and Technical Experts visited the Drought effected states and prepared/published Drought Management Strategies-2009 which has been circulated to Central Ministries/Departments and State Governments and other concerned organizations.

**(IX) Special Package for Drought Mitigation in the Bundelkhand region of Uttar Pradesh and Madhya Pradesh:**

The Government has approved a Central Sector Scheme on Special package for Drought Mitigation in the Bundelkhand region of Uttar Pradesh and Madhya Pradesh. National Rainfed Area Authority will approve the schemes for release of Additional Central Assistance and converge & monitor the Central Sector Scheme and undertake visits to area and periodically submit progress of implementation of the package to Monitoring Group in Planning Commission.

**(X) External Aided Project:**

The Authority has geared up for initiating an *Externally Aided Project* amounting to INR 1600 crore for simultaneous treatment of around 10 lakh hectare forest and non-forestlands in the forest fringe villages in the country. The scheme is proposed to be implemented jointly by the Ministry of Environment and Forest and the NRAA. In the States, the JFM Committees/WCs will be involved. The overall goal of this project is to optimised management of the fringe forests and adjoining non-forestlands for demonstration and pilot management of fringe forest areas for integrated and holistic management of natural resources. The specific objectives are:

- (i) Integrate land based activities of Agriculture, Animal Husbandry, Fisheries, Forests and Rural Development for holistic development of fringe forests and adjoining non-forestlands.
- (ii) Development of mechanisms for convergence of resources, activities and programmes to demonstrate win-win situation for upstream forest and downstream agricultural areas for ecological, water, food and livelihood security.
- (iii) Ensure better ecology and conservation of native biodiversity for adaptation to climate change response and carbon sequestration.
- (iv) Enable village institutions to develop and promote micro and medium enterprises for enhanced livelihoods of marginal and medium farmers, asset less, women and vulnerable sections of the society through development, promotion, value addition and processing of locally available natural resources.
- (v) Enhance capacity of forest departments and other developmental agencies and NGOs through joint collaboration and experience sharing.

The following elements of the work are involved in the proposed project: -

- (i) In situ moisture conservation by staggered contour trenching, contour bunds, gully plugs, pits, check dams etc for recharging sub-surface/ ground water, arresting surface runoff and help increase downstream water availability for domestic, livestock, wildlife and irrigation needs.
- (ii) Planting of indigenous grasses, medicinal shrubs/herbs, NTFPs, multipurpose tree species and legumes for reducing pressure on adjoining forest areas.
- (iii) Development and management of downstream private arable lands by suitable interventions for increased agriculture productivity.
- (iv) Promoting demand driven farming systems and rural resource based micro and medium enterprise to enhance income by the villagers.
- (v) Promoting and diversifying demand driven forest-based products (e.g. bamboo, honey, medicinal plants, floriculture, etc) and non-forest income generation activities to enhance income of asset less, small and medium farmers, women and vulnerable sections of the society for sustaining interests of these people in the conservation programme.
- (vi) Capacity building and training of FD/ village institutions/ partner implementing agencies for successful planning, implementation and monitoring of the project.
- (vii) Information needs assessments for identifying priorities for detailed project planning and articulation of overall holistic and integrated developmental activities.