EVALUATION OF RASHTRIYA KRISHI VIKAS YOJANA (RKVY)

(Final Report)

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AMC

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Director

Abbreviations

RKVY	:	Rashtriya Krishi Vikas Yojana
NADP	:	National Agriculture Development Programme
EE	:	Executive Engineer
DoWR	:	Department of Water Resource
S&WC	:	Soil and Water Conservation
SCA	:	Special Central Assistance
SCP	:	Special Component Programme
DC	:	District Council
VC	:	Village Council
IPC	:	Irrigation Potential Created
IPU	:	Irrigation Potential Utilized
CE	:	Chief Engineer
SLSC	:	State Level Sanctioning Committee
DLSC	:	District Level Sanctioning Committee
SE	:	Superintendent Engineer
CLA	:	Central Loan Assistance
WUA	:	Water Users Association
GDP	:	Gross Domestic Product
C-DAP	:	Comprehensive District Agriculture Plan
HYV	:	High Yielding Variety
SAP	:	State Agriculture Plan
RWH	:	Rain Water Harvesting

Contents

Executive Summary

A sharp declaration in growth after the mid-1990s witnessed that agricultural productivity in most of the states was quite low as it were, and the potential for the growth of agriculture was high. Concerned by the slow growth in the agriculture and allied sectors, the National Development Council (NDC), in its meeting held on 29th May 2007 resolved that a special Additional Central Assistance Scheme "*Rashtriya Krishi Vikas Yojana* "(RKVY) was launched in August 2007 to orient agricultural development strategies, to reaffirm its commitment to achieve four per cent annual growth in the agricultural sector during the 11th plan. The RKVY covers all sectors such as Crop Cultivation, Horticulture, Animal Husbandry and Fisheries, Dairy Development, Agricultural Research and Education, Forestry and Wildlife, Plantation and Agricultural Marketing, Food Storage and Warehousing, Soil and Water Conservation, Agricultural Financial Institutions, other Agricultural Programmes and Cooperation.

RKVY in Meghalaya

Though, 81% of the population depends on agriculture, the net cropped area is only about 9.87% of the total geographical area of the State. The state is deficit in foodgrains by 1.22 lakh tones annually to feed a population of 2.3 million. This is due to a lot of constraints, such as the undulating topography, transport and communication problem, population dispersal pattern, inadequate credit support, poor marketing system, etc. To overcome these hurdles, future programmes are proposed, like increasing agricultural/horticultural production and productivity, research system on the development of economically viable and location specific technologies in rainfed, flood-prone irrigated areas, and increasing the utilisation of irrigation potential etc. Due to the absence of PRI system in the state, the allocation and the projects identification are carried out at block level, under block plan in the state. A total of Rs. 221.7846 (in.cr) were approved under RKVY during the year 2011-2012.

This study was undertaken to evaluate the effectiveness of RKVY launched in seven districts of Meghalaya state. The main objective of the study was to evaluate the performance, quality, benefits of the major works undertaken by different department under RKVY, the details of which are mentioned below:

Major works undertaken under RKVY scheme by different departments

a) **Water Resource Department -** Check dams, Pipeline and Distribution, Earthen Canal, Retaining wall, Pond and RCC wall.

b) **Soil and Water Conservation Department –** Peripheral Bund, Terracing, Seed and Manures, Check dams, Water harvesting structure, Erosion control, Diversion dam, Disposal channel, protection wall.

c) **Agriculture Department** - Surface water pumping, Mini check dams, Land development.

d) **Horticulture Department** - Strengthening of Horticulture hubs, Post harvest management and subsidy to SHG, Carnation and low cost poly house, construction of farmers training centre.

e) **Fisheries Department –** Area expansion of pond, supply of fish seeds.

f) **Animal husbandry and Veterinary department -** Establishment of veterinary dispensaries, Community livestock farming etc.

Conclusions and Findings of the Evaluation Study

Based on the field study, interaction with beneficiaries, department staff, village heads, implementing officials etc., the study has drawn major conclusion and findings of the report which are as under:

a) Agriculture department

- Efforts were being made by the agriculture department to ensure maximum benefit of various implemented projects/works under the scheme to the farmers to enhance production. Out of overall sampled beneficiaries in seven districts of Meghalaya i.e 493, approx. 60% of beneficiaries reported that they have benefitted with the irrigation check dams. It was found from the evaluation of the scheme under RKVY, the maximum numbers of irrigation check dams were constructed in Jaintia Hills while the least are in South Garo Hills district. In Jaintia hill district the most benefitted block from check dams under command area in ha. is Thadlaskein block.
- The construction of mini check dams are for the benefit of the farming community of the state. Hence, the department is considering all out option to address problems face by the farmers so as to ensure regular supply of available irrigation water, improve capacity

building, awareness of modern farming methods etc. to increase crop production through cropping intensity, multiple cropping, introducing improved and high yielding varieties.

- The major setback for the dams is lack of provision for repair and maintenance.
- The irrigation check dams have helped in transforming the agriculture of the surrounding areas by holding the monsoonal rains for longer after they have stopped.
- The land development in particular in border areas has helped in converting waste land in to cultivable land.
- The average land holding is around 1.5 acres comprising all the seven districts in the state. The lowest average land holders are from South Garo Hills district which is around 0.5 acres. The literacy level of the beneficiaries is also not satisfactory. Most of the beneficiaries involved in the farming are from middle age group, while rests of them are from young age group.
- The provision of power tillers, improved power and manually operated farm implements and canopy management tools are also the incentives that have made a difference during the recent years through the scheme.
- Lack of capacity building and technical assistance.
- Less awareness about modernized farming methods.
- Lack of good market linkages.
- Non-availability of HYV Rice for higher altitude region.
- Less technical competencies amongst the field functionaries.
- Till now 66 sluice gates are constructed out of which many of them are not in a good shape. In most of the visited area they have rusted. Shallow Tube Well not feasible in Hilly areas due to low water level at the ground which will not be sufficient for standing crop (Paddy) during winter.
- Most of the operational holdings are below 1.5 ha. The size of operational holding is very small. Such small holdings are uneconomic and results in under-investment in agriculture leading to low input use and low production.

b) Horticulture department

- During the evaluation study of this project, it was found that out of the target beneficiaries approx. 65% of beneficiaries of these projects are satisfied with these schemes. It was revealed that with the provision of seed distribution to the farmers under RKVY, tomato cultivation of East Khasi Hills district has set positive example.
- The department has successfully set up Horticulture Hubs in all the seven districts of the State with specialization in flowers and high value vegetables. Each horti hub is served by spokes comprising collection centres and crop clusters of surrounding villages within a radius of 10 Km. It was found that maximum horti hubs were established in West Khasi Hills under RKVY.
- The use of green house technology, poly-houses, drip and micro irrigation system, water harvesting structures, fustigation, soilless culture has helped in minimizing risk and helped farmers overcome the vagaries of nature as well as to standardize quality of produce and reduce economic losses.
- The horticulture department has adopted a modernized and attractive approach. The projects so far has created lot of interest amongst the beneficiaries particularly the housewives and young farmers.
- The sub schemes under the project titled “Development of hub and spoke model of Horticulture” has helped a lot in flourishing the Horti Culture amongst the people of the region, it helped in achievement of sustainable amount of income.
- In every district in the state the department is having collection centres and required facility for storage of items.
- The major infrastructure support provided under RKVY is for development and upgradation of horti hubs in all the districts through fencing, installation of pump set, Diesel generator, Water harvesting tanks, guest houses, grading hall etc., Green house, low cost poly house, carnation spoke etc.
- The major weakness was found during the study in this sector are marketing and training to adopt new technologies. The monopoly of the private traders, weak cooperatives and lack of market intelligence are the major constraints in marketing. And also farmers are into requirement of demonstration of best practices and training to adopt new technologies for horticulture.

- During the study it was also found that only 10% of the respondent is highly satisfied with the training programmes conducted. However, 35% of the respondents are not fully satisfied with the training programmes conducted. While around 55% of the respondents have not participated in any training programme. Basing on the field visits and available data it is suggested to undertake more capacity building programmes and also encourage the trained farmers to be the facilitators to spread appropriate technologies to the neighboring farmers.

c) Animal Husbandry & Veterinary department

- Under RKVY scheme, 14 different schemes have been implemented in different districts. Out of these, 50% of the schemes are based on community piggery. All the schemes implemented are showing good progress especially the Poultry farm at Nongpiur, cattle farm and the Pig farm at Khliehtyrshi.
- Pig Farm and Poultry Farm at Nongpiur was established under RKVY in 2008-09 and 2009-10 respectively with the sole aim to augment production of quality seeds in the interest of farmers. Since creation of post as required in these farms are lying pending, the department has made stop gap arrangement in redeploying officer and staff from various establishment. Both the farms are performing well, but they will need creation of post accordingly. For the Pig Farm, Khliehtyrshi and Gindo, support staff will be required as per standard norms submitted by the Department to the Government.
- The veterinary dispensaries constructed under the scheme are operational and providing good results. However, the veterinary dispensary at Ichamati and Khonglah still lacks Grade IV staff.

d) Water Resources department

- Under the RKVY scheme, the irrigation department has focused on rain water harvesting structures which can help in irrigation throughout the year. Maximum no. of RWH schemes are implemented in West Khasi Hills, East Khasi Hills and Ri Bhoi, while the least is in South Garo Hills. Around 920 numbers of families have been benefited under this scheme. It was found from the study that under RKVY scheme from 2007-08 to 2011-12 out of total 920

families benefitted through WHS, the maximum no. of families benefitted were from West Garo Hills district i.e 232 out of this 115 are from Selsella block of this district.

- The structures built under the scheme are quite okay, while the lack of staff for supervision is a concern. So far, the thrust in these sectors is in Area expansion of Boro Paddy through irrigation support to increase the yield to 3-4 MT/Ha as against the existing 1.5-2.00 MT/Ha.
- Almost in all the districts there is not much emphasis on formation of Water Users Association (WUA), Even though it is being formed in districts, the participation is not there. Even most of the beneficiaries are not fully aware of the purpose of formation of WUA.
- Due to financial incapability almost 69% of the cultivable land remains unirrigated, while 27.5% say it is due to water scarcity.
- The problems of head load due to difficult terrain leading to high cost of the project.
- Non-availability of proper vehicles for supervision of works, shortage of manpower, land disputes leading to delay in completion.
- Beneficiaries under RKVY schemes are supposed to look after the repairing and maintenance works after completion of the project. These RKVY schemes implemented by the department are small projects providing irrigation facilities and in which canal system can be repaired and maintained by the beneficiaries in the spirit of Participatory Irrigation Management. Hence, there has not been any provision for repairing and maintenance work for conveyance system.

e) Soil & Water Conservation department

- During the last three years the department has undertaken several projects for the improvement of traditional water conservation system and agricultural productivity in the state. Apart from these, steps were also taken for restoration of cultivable land affected by mining and quarrying. Around 35 works were undertaken under different schemes in 10048.06 hectares.
- The Soil and Water Conservation Department has taken several steps under the Jhum control scheme focusing on Land Development, Afforestation, Water Conservation and distribution works, Cash crop development, Follow-up programme, Camp and camp equipments, Dwelling house, link roads etc.

- The Present norms covering of Rs. 16500/ Ha are too low for a hilly District which reduces the effectiveness of the Programme.
- There needs to be awareness programme relating to soil erosion and water conservation.

f) Fisheries department

- As compared to all other departments, Fisheries department lacks in infrastructure facilities and manpower for proper monitoring of the schemes implemented under RKVY at district level.
- However, it is interesting to note that as per the findings from the study based on the beneficiaries' view point, while interviewing some of the beneficiaries we received great feedback about the satisfaction. It was found that out of the total sample beneficiaries; approx. 62 % beneficiaries have rated this scheme satisfactory.
- During the last three years approximately around Rs. 30.33 crores of rupees have been released for different projects under RKVY. Out of which the maximum allocation was made for Area Expansion under Meghalaya State Aquaculture Mission. While only Rs. 5 crores were sanction under 1000 pond scheme for the farmers.
- During the year 2010-11, 18 lakhs fish seeds were supplied from different farms to the farmers under the RKVY scheme.
- Around 3677 number of beneficiaries has been benefitted under the scheme "Area Expansion of Pond Aquaculture"**.** The total area covered under the scheme is 508.2 hectares and about 74 nos. of Community Ponds have been developed under NMPS.
- The Cost of construction of fishing pond in hilly area is more compared with plain area.
- Lack of fund for monitoring of schemes, lack of vehicles, shortage of manpower.

g) Cooperation department

- Under Rahstriya Krishi Vikas Yojana (RKVY) Cooperative department have provided support to 19 Diary and Livestock Societies in the state at an estimated budget of Rs. 100.00 (in lakhs). The support was provided during the year 2011.
- The financial assistance under RKVY has helped the Diary and Livestock societies in improvement of their production to some extent.

Recommendations

Based on the above mentioned findings of the overall study, the following recommendations are made:

- The irrigation check dams has helped in transforming the agriculture of the surrounding areas by holding the monsoonal rains for longer after they have stopped, still there is need for new and sustained irrigation techniques which will in turn prolong the crop growing season.
- There needs to be provision of corpus funds for maintenance and renovations of constructions carried out under the scheme and Increasing the cost norms from Rs. 1.5 lakh/ha to Rs. 2.5 lakh/ha.
- There needs to be more emphasis towards catchment area development and More importance needs to be given for land development such as widening of cultivable land, terracing and improvement of waste land etc.
- There needs to be constant monitoring and supervision of progress of sanctioned projects at district level.
- There also needs to be more focus on schemes like land reclamation, compost pits, fencing for winter cropping, farm mechanization etc.
- Capacity building and awareness component may perhaps be incorporated to enhance the receipt ability of the stake holders.
- There needs to be lining of canal to reduce seepage losses.
- Creation of post for field staff and appointment of permanent engineering staff at district level under Agriculture department.
- Under fisheries department the construction cost needs to be increased for better implementation.
- The funds need to be disbursed on time so that the scheme could be completed well on time.
- There needs to be major focus for the construction of bank stabilization (retaining wall) in the paddy fields, to protect the paddy fields from being washed away during heavy rainfall.
- The horti hubs need to be provided with functional and administrative autonomy to develop them as localized centers of excellence.

- While restoration of cultivable land affected by mining and quarrying, there needs to be inclusion of affected person's perceptions, opinions and defined needs in the planning of any mitigation actions so that local realities and local priorities are properly incorporated. The planning and design process under restoration scheme needs to suit all interested parties and their issues such as later access rights by different sections of the community. The planning and design processes needs to be linked to the form of the forest restoration as plantations (single or multiple species, timber or multi-use species).
- Through the pond expansion scheme there has been upliftment in the socio economic condition of the fish farmers, but there needs to be more awareness and capacity building activities for the participation of beneficiaries in a right path. They need to understand the benefit of fishing and the changes it can bring in their life style.
- Proper coordination amongst the entire department needs to be ensured at district as well as state level involved in implementation of the scheme.
- The project plan needs to be prepared, which should involve inputs from those officials who are involved in implementation of the scheme. Their inputs in terms of socio economic condition of the proposed plan, construction and extent of involvement of local communities during execution of the project.
- There needs to be focus on making a proactive plan for increasing agricultural/horticultural production and productivity, research system on the development of economically viable and location specific technologies in rainfed, flood-prone irrigated areas, and increasing the utilization of irrigation potential etc.
- There needs to be focus on human resource development under the scheme.
- It was found during the survey that farmers require demonstration of best practice for adopting new technologies. Presentation of new technologies and crop management practices are being taken up on the fields of progressive farmers who have got the assistance for inputs. The success stories of the farmers will be documented by audio-visual methods and shown to other farmers for their awareness and learning.

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Chapter – 1

Background and Context of the study

1.1 Background

Economic reforms initiated since 1991 have put the Indian economy on a higher growth trajectory. As per the information perceived from Agriculture department's website, annual growth rate in the total Gross Domestic Product (GDP) has accelerated from below 6 per cent during the initial years of reforms to more than eight per cent in recent years. The Planning Commission in its approach paper to the Eleventh Five-year-plan has stated that nine per cent growth rate in GDP would be feasible during the Eleventh Plan period. However, Agriculture accounting for more than 30 per cent of total GDP at the beginning of reforms, failed to maintain its pre-reform growth. On the contrary, it witnessed a sharp deceleration in growth after the mid-1990s. This happened despite the fact that agricultural productivity in most of the states was quite low as it were, and the potential for the growth of agriculture was high. Agricultural production over a time is affected by interacting influences of technological, infrastructural and policy factors. Infrastructure and institutional changes in economic reforms seems to be a matter of serious concern, especially when we are leading a growth strategy with globalization.

Concerned by the slow growth in the Agriculture and allied sectors, the National Development Council (NDC), in its meeting held on 29th May, 2007 resolved that a special Additional Central Assistance Scheme (RKVY) be launched. The NDC resolved that agricultural development strategies must be reoriented to meet the needs of farmers and called upon the Central and State governments to evolve a strategy to rejuvenate agriculture. The NDC reaffirmed its commitment to achieve 4 per cent annual growth in the agricultural sector during the 11th plan.

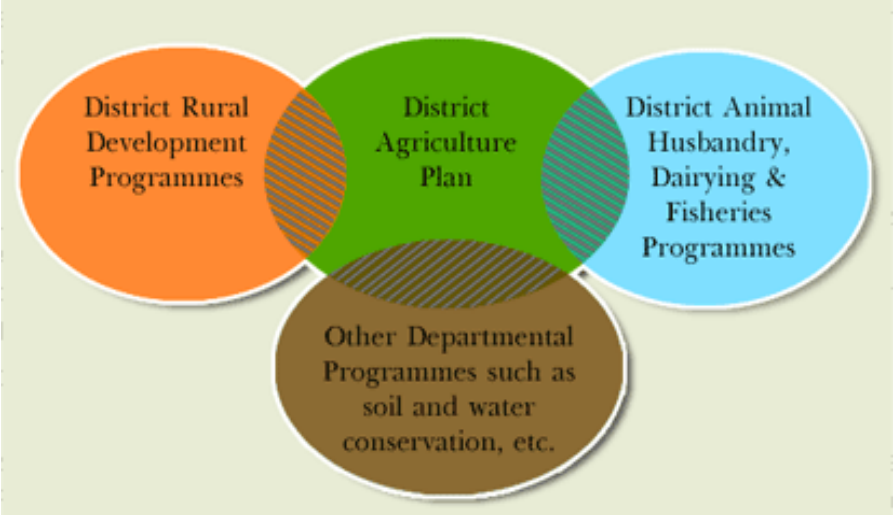
The RKVY aims at achieving 4% annual growth in the agriculture sector during the XI Plan period, by ensuring a holistic development of Agriculture and allied sectors. The main objectives of the scheme are:

- To incentivize the states so as to increase public investment in Agriculture and allied sectors.

- To provide flexibility and autonomy to states in the process of planning and executing Agriculture and allied sector schemes.
- To ensure the preparation of agriculture plans for the districts and the states based on agro climatic conditions, availability of technology and natural resources.
- To ensure that the local needs/crops/priorities are better reflected in the agricultural plans of the states.
- To achieve the goal of reducing the yield gaps in important crops, through focused interventions.
- To maximize returns to the farmers in Agriculture and allied sectors.
- To bring about quantifiable changes in the production and productivity of various components of Agriculture and allied sectors by addressing them in a holistic manner.

For better implementation of the scheme each state government has to prepare a State Agricultural Plan, which is a two way method. In one method, the state nodal department (Agriculture Department) could obtain the draft DAPs from the districts in the first instance and examine if aspects of importance to the state are properly covered in the district plans or not. For example, at the state level, the vision could be to set up fertiliser quality testing labs in certain districts. The state should, at this stage of scrutiny, ensure that establishment of the fertilizer testing labs is incorporated in the District Agricultural Plans of the districts concerned. Ensuring that the state's priorities with respect to Agriculture and allied sectors are appropriately captured in the District Agricultural Plans would be the responsibility of the nodal department/ State agency vested with the responsibility of preparing the SAPs. In the other method, the state Nodal Agency could communicate to the districts in the first instance, the state's priorities that ought to reflect in the respective district plans and the districts may incorporate these in their district plans .

A pictorial representation of the DAP is in the box.



Major Tasks and Steps taken in the Formulation of C-DAP

Sl No.	Tasks	Steps
1.	District Analysis	District Analysis Preparation of Village and District Profiles : (Collection and collation of essential data to present an articulated statistical profile of the village/district.) Resource Inventory analysis: (Malady Remedy analysis) ❖ Physical resources ❖ Human resources ❖ Infrastructural and institutional resources **Context Analysis** a) Review of on-going development programmes to bring out development gaps and extent of resource utilization. b) Intra-district levels of development analysis c) c) Technological Appraisal d)
2.	Vision and Strategy Formulation	"Felt needs of the rural population based on Needs Statement obtained from each village. Determination of District-specific goals within the overall framework of national goals". Formulation of developing strategy for the district indicating the major thrusts and priority areas of development
3.	Sector and Project Analysis	Determination of Sectoral objectives Analysis of the development Potential: a) Productive sectors b) Infrastructural sectors c) Basic Needs sectors

		A. Project preparation and appraisal B. Assignment of inter-sectoral and intra-sectoral priorities on the C. basis of resource availability, administrative feasibility and expected beneficiaries. D. Spatial Distribution of the investible resources.
4..	Inter-sectoral coordination	Institution of sectoral consistency checks. Analysis of primary and secondary sectors relationship.
5.	Financial Resources Analysis & Allocation	Estimate investment requirements and sources of finance eg. Government-sectoral funds and any untied funds placed at the disposal of the local body a) Local resources b) Banks c) External aid Allocation of financial resources to villages and Blocks Spatial and temporal distribution according to agreed strategy
6.	Budgeting	Working out cost estimates of identified programmes and projects Matching of identified programmes and projects with available resources. Determining the optimal programme sequences.
7.	Implementation	Phasing of development activities Ensuring the orderly flow of funds Task adoption: Articulation of Agency responsibilities with respect to programme execution, co-ordination, monitoring and supervision of activities. Monitoring and evaluation

1.2 RKVY in Meghalaya

The economy of Meghalaya is basically agrarian as it is rural based with Agriculture playing a predominant role in the state's economy. The State's employment and income generation depends on Agricultural developmental activities to a great extent. The State is yet to touch the National Level in economic and agricultural growth rate even after attaining full statehood more than twenty-five years ago. The State is slowly and steadily progressing in spite of the numerous constraints and limiting factors. Practicing of improved and modern methods of Agriculture by the farmers, using of Chemical fertilizers, Plant protection measures and introduction of High Yielding Variety (HYV) seeds of Paddy, Wheat, Maize etc has contributed to the increase in production of food grains. Mechanization of Agriculture has gone up to some extent.

Though, 81% of the population depends on agriculture, the net cropped area is only about 9.87% of the total geographical area of the State. The state is deficit in foodgrains by 1.22 lakh tonnes annually to feed a population of 2.3 million. This is due to a lot of constraints, such as the undulating topography, transport and communication problem, population dispersal pattern, inadequate credit support, poor marketing system, etc. To overcome these hurdles, future programmes are proposed, like increasing agricultural/horticultural production and productivity, research system on the development of economically viable and location specific technologies in rainfed, flood-prone irrigated areas, and increasing the utilisation of irrigation potential etc.

Climate and Rainfall

The climate of Meghalaya varies with the altitude. The climate of Khasi and Jaintia Hills is uniquely pleasant and bracing. It is neither too warm in summer nor too cold in winter, but over the plains of Garo Hills, the climate is warm and humid, except in winter. True to its name, the Meghalaya sky seldom remains free of clouds. The average annual rainfall is about 1,150 cm.

Flood affected areas are mostly on the low altitude areas, bordering Assam and the international border (India- Bangladesh). Flash floods have become a regular feature in these areas, due to massive deforestation, unchecked jhum cultivation. The flood water carries huge amount of hill sand, stone, logs and trees, which are deposited in agricultural fields due to inundation of banks in the foot hills, thus causing immense damage to crops.

The key to the health of the farm sector in the state lies in the health of the forest cover in the state. Every peak, every square inch of the upper range of the hills need to be under mixed forest cover to protect the soil from leaching and erosion to help regulate and decrease the fury of streams and rivulets during the monsoon season.

Soil

The soils of the hills are derived from gneissic complex parent materials; they are dark brown to dark reddishbrown in colour, varying in depth from 50-200 cm. The texture of soils varies from loamy to fine loamy. The soils of the alluvial plains adjacent to the northwest and southern plateau are very deep, dark brown to reddish brown in colour and sandy-loam to silty-clay in texture.

Meghalaya soils are rich in organic carbon, which is a measure of nitrogen supplying potential of the soil, deficient in available phosphorous and medium to low in available potassium. The reaction of the soils varies from acidic (pH 5.0 to 6.0) to strongly acidic (pH 4.5 to 5.0). Most of the soils occurring on higher altitudes under high rainfall belt are strongly acidic due to intense leaching. Base saturation of these soils is less than 35 %. These soils are not suitable for intensive crop production.

There is not much difference in fertility classes of the soils of the State. Four soils fertility classes, namely, High Low Medium (HLM), High Medium Medium (HMM), Medium Medium Low (MML), Medium Low Medium (MLM) have been established from the soil test data so far compiled in the Soil Testing Laboratory of the State. Regarding micronutrient status, it has been observed that almost all the acid soils of the North-Eastern region of the country are deficient in available Boron (B) and Molybdenum (Mo). Acid soils of Meghalaya are rated low in available B and Mo. Total Zinc, Copper and Manganese contents of these soils vary from 10.00 to 17.25, 17.00 to 71.00 and 110 to 770 ppm (parts per million), respectively and DIPA (Diethylene Triamine Penta Acetic Acid) extractable zinc, copper and manganese contents of these soils ranges from 0.72 to 3.20,n 0.6 to 2.8 and 3.0 to 162.0 ppm respectively.

Land Use Pattern

Land use pattern is envisaged on land capability profile. Since land capability in the mountainous region is determined by the characteristics of micro and mini watersheds, land use pattern is therefore envisaged on the capabilities of each watershed and thus the potential of each watershed is thus envisage to be developed to yield sustainable land use. Broadly the low lying areas were put under paddy during Kharif and with pulses, paddy, vegetables and oilseeds during the Rabi season depending on the availability of residual moisture and irrigation facilities.

Gentle slopes up to 20% were put under other crops like wheat, paddy, maize, pulses, oilseeds, vegetables etc, which not only contribute towards food security but also yield substantial revenue returns per unit of land and labour. On such slopes the concept of watershed management of land and water would be encouraged. Horticulture was taken up on slopes above 20% and Border Areas, which are traditional horticultural areas, received special attention. Forest cover in the State

(42.01%) is below the national norm of 60% recommended for hilly areas. This is because a sizable proportion of the Forest area is reportedly under shifting cultivation resulting in depletion of the Forest Cover. A very meagre proportion of the geographical area (9.90%) is net sown area, including area under shifting cultivation. The potential net sown area could be increased if and when the fallow lands are utilized for cultivation purposes. The cultivable waste land of the state is 20.63% of the geographical area a part of which might be progressively utilized for cultivation purpose in the long run. The cropping intensity of the state is 120%.

Land Holding in Meghalaya means the operational holdings, as there is little concept of ownership under the traditional land system. The pattern of operational holdings in the State is characterized by the predominance of small and marginal farmers (below 2 Ha.) who operate 82.57% of the total cropped area.

1.3 Agriculture crops in Meghalaya

Food-grains constitute the main food items of the entire population in the State. The food grain production sector covers an area of over 47.8 per cent of the total crop area in the State during the period 1990-91 to 2000-01. With the introduction of high yielding varieties (HYVs') of different crops in the mid-seventies, a remarkable increase in food-grain production has been achieved. A major breakthrough was achieved when HYVs' of paddy such as Pankaj, IR8 and other improved varietal series like IR36, suitable for Rabi season and fitting in the multi-cropping system have been cultivated in the feasible areas of the State.

The bulk of production of Rape and Mustard is in Garo Hills, which constitutes upto 96% and 97% of the Area and Production under oilseeds respectively. Other oilseed crops are Groundnut, Soyabean, Sesamum, Castor, Linseed and Sunflower. During 2000–01, the total Area and Production of oilseeds was 9503 Ha. And 6374M.T. respectively. It may be mentioned that although soyabean is primarily considered a pulse, it is also grown in the State as an oilseed crop. Out of the total area of 983 Ha. under Soyabean, the districts of Ri Bhoi, East and West Khasi Hills and Jaintia Hills accounts for 744 Ha.

Cotton, Jute and **Mesta** are the important fibre crops grown in the State. These crops have been the traditional cash crops of Garo Hills. Among these, Cotton has the highest area under cultivation and is grown exclusively in the Garo Hills districts. It is also widely known in the country and was marketed during the pre-independence period through the Comilla market. As such, the Garo hills varieties of cotton were also known as Comilla cotton. The variety D. 46-2-1 belonging to the Gossypium arboreum has a good market as short staple cotton, which is also used sometimes for mixing with wool.

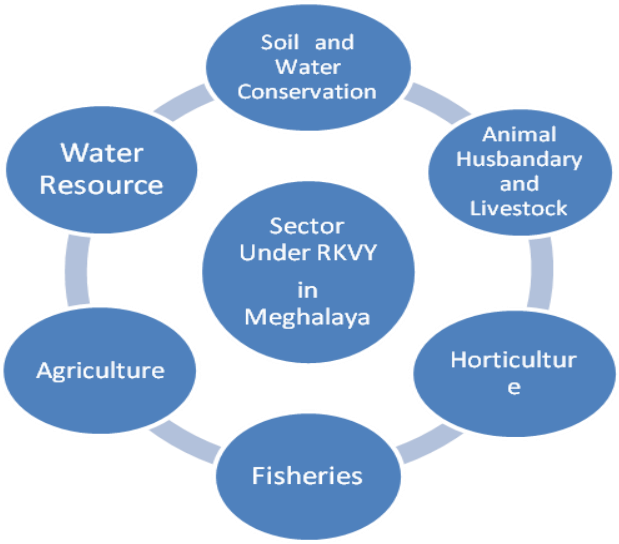
1.4 Horticulture crops in Meghalaya

Meghalaya is favorable for a variety of sub-tropical and temperate fruits. Sub-tropical fruits grown include **citrus species, pineapple, banana, papaya, guava** and **jack-fruit**. Temperate fruits such as pear, peach and plums are widely grown in the Khasi Hills districts of the State.

The State of Meghalaya is known for a large array of vegetables both sub-tropical and temperate. Some of the important sub-tropical vegetables are **cucumber, pumpkins, bitter gourd, beans, brinjal**, a variety of leafy vegetables, etc. Temperate vegetables include **cabbage, cauliflower, tomato, peas, radish, carrot, beet,** etc. In addition, there are certain indigenous vegetable crops that are grown in the State like **tree tomato** (*cyphomandra betacca*) and **squash.** Meghalaya has a good scope for cultivation of a wide range of tuber crops of which the important ones are **Potato, Sweet Potato, Yam, Colocasia** and **Tapioca.** Since time immemorial, Arecanut has been grown in Meghalaya as an important commercial crop. In the recent past this crop has been introduced in the northern slopes of Khasi Hills and Ri-Bhoi districts and is found to be doing well. According to the data of the last fifteen years the area, production and productivity has been increasing at an annual average computed rate of 306 Ha, 531 MT and 28.046 kgs/Ha respectively. Comparing this with the data of 1971–72 to 1991–92 wherein the annual average computed rate of increase in the area, production and productivity is 40 Ha, 150 MT and 9.71 kgs/Ha respectively, it can safely be inferred that the effect of 'Bud Rot' disease is decreasing and there is a bright prospect for the areca nut growers of the State in future.

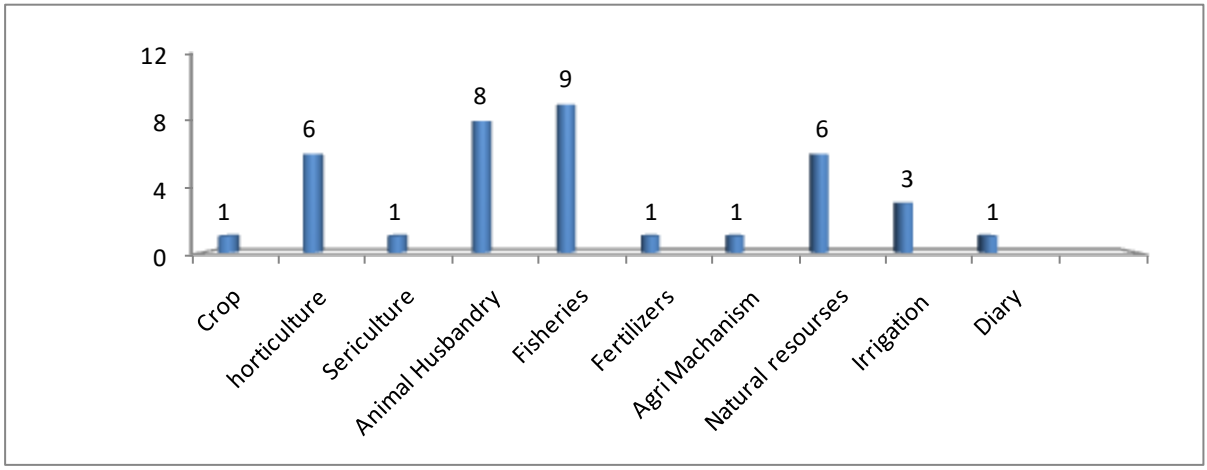
Under the State Agriculture Plan the state Government had predicted a growth of 4% for the agricultural sector through extensive cultivation by bringing about 42,000 ha of waste land under

cultivation. Due to the absence of PRI system in the state, the allocation and the projects identification are carried out at block level, under block plan in the state. A total of Rs. 221.7846 (in cr.) were approved under RKVY during the year 2011-12, out of which, Rs. 6.4470 (in cr.) were incurred. The RKVY scheme in the state is implemented through the departments mentioned in below diagram.



No. of ongoing projects in each sector under RKVY during 2011-12

Number of the projects in each above mentioned sector during 2011-12 is mentioned below in a chart. It is seen from the chart that the major no. of projects belongs to fisheries department.



The National Agriculture Development Programme (NADP)/ Rashtriya Krishi Vikas Yojana (RKVY) aims to achieve 4 % annual growth in the agriculture sector during the XI Plan period by ensuring a holistic development of agriculture & allied sectors. The RKVY is an Additional Central Assistance

(ACA) scheme for the agriculture and allied sectors, and was approved on 16 August 2007, with an envisaged outlay of Rs.25,000 crore during the Eleventh Five Year Plan. The RKVY aims at contributing to achievement of 4 per cent annual growth in the agriculture sector during the Eleventh Plan period, by ensuring the holistic development of agriculture and allied sectors.

The RKVY scheme has been formulated with two strategic objectives in mind first, to incentivize states to allocate more funds for agriculture and allied sectors, and second, to enable states to generate additional growth in agriculture and allied sectors through better planning and by undertaking appropriate growth oriented projects to achieve this goal. This is to be done by drawing up plans for agriculture and allied sectors in a comprehensive manner, by integrating livestock, poultry, and fisheries and reflecting needs/crops/priorities of different areas, taking agro-climatic conditions, natural resource endowment and technology into account. Funds are provided to states as a 100 per cent grant by the Central Government.

RKVY does not prescribe any particular strategy, programme, or project to be implemented by the states. RKVY was designed to focus fund allocation and the states' attention to achieving growth in agriculture, and to incentivize them to allocate more resource and take up plans which can generate growth. State governments, keeping in view their priorities, has to approve project proposals for implementation under the RKVY in many sectors, including crops, horticulture, organic farming, farm mechanization, micro/minor irrigation, watershed development, agriculture marketing and storage, seed farms, and soil/fertilizer testing laboratories, which have been starved over the years due to paucity of funds in the state.

The scheme envisages mostly on increasing the agriculture productivity through various modernized, traditional methods. The local farmer needs to be involved in the implementation of irrigation projects in their respective areas. This shall act as a bridge between the departments and local community in their differences in cost over runs, non availability of material etc. The project plan needs to be prepared, which should involve inputs from those officials who are involved in implementation of the scheme. Their inputs are needed in terms of socio economic condition of the proposed plan, construction and extent of involvement of local communities during execution of the project.

Chapter – 2

Objectives and Methodology

2.1 Objective of the study

The specific objectives for the study are as follows:

Agricultural Department

- No. of mini irrigation check dams constructed under RKVY since inception
- Assessment of operational and non-operational check dams
- Command area in hectare and farmers benefited from each dam
- Potential outcomes of check dams for ensuring rural sustainable livelihood
- Nos. of sluice gates / surface water pumps/ shallow tube wells constructed
- SWOT analysis of the scheme
- Social impact and acceptability of the scheme
- Feedback from target beneficiaries
- Suggestion and recommendation for overall improvement of the scheme

Horticulture Department

- Infrastructure facilities provided to the growers for cultivation of different horticultural crops including floriculture
- Impact of infrastructure/subsidy support for cultivation/development of different types of horticulture crops and floriculture
- Varieties and quantity of seeds supplied per grower
- Amount of subsidy given to growers per beneficiary crop wise
- Amount of production produced by individual beneficiary – crop wise in MT
- Marketing facilities created for growers for marketing of crops and flowers
- Income generated from marketing of crops and flowers
- Social impact and acceptability of the scheme
- SWOT analysis of the scheme
- Feedback from target beneficiaries
- Suggestion and recommendation for overall improvement of the scheme.

Animal Husbandry & Veterinary department

- No. of veterinary dispensaries established under RKVY since inception of the scheme
- Details of area, location where dispensaries have been established
- Types of facilities available at each dispensaries
- Types of facilities available in farms in terms of feeds, water etc.
- Amount of production from each farm since inception of RKVY scheme
- SWOT analysis of the scheme
- Social impact and acceptability of the scheme
- Feedback from target beneficiaries
- Suggestion and recommendation for overall improvement of the scheme

Water Resource department

- Types of scheme covered under rain water harvesting
- Different areas/locations where rain water harvesting have been set up
- Command area in hectare benefited from each scheme
- Beneficiaries covered per command area
- SWOT analysis of the scheme
- Social impact and acceptability of the scheme
- Feedback from target beneficiaries
- Suggestion and recommendation for overall improvement of the scheme

Soil & Water conservation department

- To assess the increase in crop productivity from river valley / bottom land
- Improvement of crop production in abandoned/cultivated land
- Improving traditional water conservation and distribution system for enhanced crop production
- Restoration of cultivable land affected by mining and quarrying
- SWOT analysis of the scheme
- Social impact and acceptability of the scheme
- Feedback from targeted beneficiaries
- Suggestions ad recommendation for overall improvement of the scheme

Fisheries Department

a. Types of technology adopted for up gradation and modernization of farms
b. Varieties of fish seeds supplied to the farms
c. Area expansion of pond aquaculture
d. Impact on production resulting from modernization and up gradation of farms
e. Details of beneficiary covered under area expansion of ponds
f. Benefits derived by the beneficiary as a result of pond expansion
g. SWOT analysis of the scheme
h. Social impact and acceptability of the scheme
i. Feedback from targeted beneficiaries
j. Suggestions and recommendation for overall improvement of the scheme

COOPERATION DEPARTMENT:

The Study was covered schemes implemented since inception.

1. Nos. of Cooperative Societies assisted under RKVY and types of Cooperative Societies to be clearly indicated.
2. Areas/ villages where Cooperative Societies have been set up under RKVY
3. Members/ Shareholders of each Cooperative Society.
4. Name of Cooperative Societies functional and nonfunctional after receiving the financial assistance.
5. Benefits derived by the Beneficiary / Society from the individual scheme.
6. SWOT Analysis of the scheme.
7. Social impact of the scheme.
8. Social acceptability of the scheme.
9. Feedback from target groups/ beneficiaries.
10. Suggestions and recommendations from the Agency conducting the study for overall improvement of the scheme.

2.2 Approach and Methodology

In order to measure the impact of the scheme on study indicators, a triangular of research methodologies was used to obtain both quantitative and qualitative information. The set of methodologies employed included those that involved measurement of the scheme success on the basis of already existing measures and measurement of the success of the programmes by the constructing new measures.

Desk research

Various records available with the concerned department involved in the implementation of the Scheme were examined to ascertain relevant information regarding implementation of the programme. Relevant data related to scheme infrastructure, technological up gradation, annual action plan etc. were also obtained from the convergence departments, for the reference period of the study

- Number of beneficiaries under the scheme/activity.
- Profile of beneficiaries (by gender and SC/ST etc.)
- Impact of the scheme on individual basis
- Monitoring mechanism adopted
- Department wise success rate achieved under RKVY
- Transparency
- Awareness
- Income generation
- Modernization goals

Interviews with officials

Officials involved in the implementation of the scheme at the district, block, and village levels were interviewed to ascertain information regarding the implementation of programmes, their experiences in implementation, nature of effects/ impacts observed, factors influencing success of programmes, cases of positive impacts, etc. These discussions also bring out the nature of constraints / difficulties faced in implementation and help identify corrective measure to enhance the impact of the scheme. The interviews were conducted with the help of semi-structured

interview schedule (design after consultation with the Programme Implementation and Evaluation Department).

Discussion with District/Village council members

Discussions were carried out with few of the members of District Councils having a proper understanding of the local situation and who provided valuable qualitative information to understand the nature and magnitude of impact of scheme, implementation related limitations, relevance and proper targeting of the programmes in the local context.

Observation

Observation technique is an effective tool of capturing visual information on the condition, use and effects of the various interventions under the programmes. Both structured and unstructured observations were conducted in a natural setting to supplement the information provided by beneficiaries / officials and other representative related with the scheme.

Interviews with beneficiaries

The impacts of the scheme on the intended beneficiaries were assessed through the face to face personal interview with help of semi-structured interview schedule. The schedules were developed so as to help measure the impact on both the individual beneficiary and family towards the scheme. the respondent was the beneficiary himself / herself.

Focus group discussion

These discussions were conducted amongst a homogeneous group of the targeted audience (beneficiaries and local representatives etc.) comprising 8 to 12 members per group. The discussions were very useful in enriching our understanding of different types of impact and the factors contributing and hindering positive impact.

2.3 Sample Size and design

This evaluation study covered seven districts of the State comprised of East Khasi Hills, West Garo Hills, East Garo Hills, West Khasi Hills, Janitia Hills, South Garo Hills and Ri Bhoi Holls. Further, each district was divided into blocks for sampling purpose.

- four blocks were covered from East Khasi and West Garo Hills;
- three blocks were covered from East Garo Hils, West Khasi hills and Janitia Hills;
- two blocks were covered from South Garo Hills and Ri Bhoi Hills.

The sample size for each district was specified in terms of a target number of beneficiaries covered. The target sample size was constructed based on the list of total no of beneficiaries covered, projects sanctioned and units under RKVY in seven district of Meghalaya, which was provided by the concerned department of Government of Meghalaya. Considering the size of districts, the time and resources available for the survey, sample size of 25% out of the total no. of beneficiaries covered, project sanctioned and units available were prepared.

The sample was drawn such that there are sufficient numbers of observations in the sample of beneficiaries belonging to different schemes under this programme. For this further, two stages stratified sampling design were adopted involving selection of villages, projects and units in each blocks of the seven districts followed by selection of households.

The 2011 census list of villages was used as the sampling frame for the selection of the blocks and villages respectively. Villages were stratified prior to the selection on the basis of a number of variables. The first level of stratification was based on geographic patterns, with blocks grouped into regions according to their geophysical characteristics. Within each of these regions, villages were further stratified using some of the following variables: Village size, distance from the town, proportion of non-agricultural workers and, proportion of population belonging to scheduled casts / scheduled tribes and female literacy.

Villages were the primary sampling unit (PSU) for the survey and were selected systematically, with probability proportional to size (PPS). Adjacent villages with small population sizes were combined into a single PSU for the purpose of sample selection.

The list of households receiving benefit under RKVY targeted at individual / households / groups in the selected PSU's were obtained from the concerned department officials prior to the commencement of the field survey. This served as the sampling frame for selecting beneficiary. The households in the selected villages were stratified as beneficiary and non-beneficiary households. Beneficiary households are defined as those receiving benefit under the scheme.

The sample size covered under the study is as follows:

Sl. No	Name of Department	No. of Beneficiaries to be covered	No. of Units /Projects
1.	Water Resources	194	232
2.	Fisheries	200	25% of total units/projects
3.	Agriculture	493	25% of total units/projects
4.	Soil & Water Conservation	2487	25% of total units/projects
5.	Animal Husbandry & Veterinary	20	25% of total units/projects
	Total	3394	

2.4 Project Execution and Quality control

The field work was carried out by a team of graduate/post graduate interviewers, specially trained for the purpose of the study. Training of the field team was crucial for carrying out a study of such sensitive nature where quality of the fieldwork is of utmost importance. Both theoretical (regarding key concepts and techniques) and on-the field training was imparted to the teams to cover issues like:

- Study objectives
- Target segment
- Orientation to questionnaires
- Desensitization exercise, mock interviews and role plays
- Process to be adopted to approach the respondents
- Manner of canvassing questionnaires and possible ways to tackle sensitive / hostile attitude of the respondents.

During the conduct of the field-work due care was taken to adhere to the ethical standards. The respondents were interviewed under the condition of assured anonymity, but were provided full information of the purpose of the study. During the process, the respondents were given full rights to refuse to participate and were replaced to ensure sample coverage. Further, to ensure quality, continuous monitoring of the field-work was undertaken by the field executive, under the direct supervision of research professionals. Interviewers were accompanied by the supervisors to ensure quality of field-work. Scrutiny of the schedules was done on daily basis on the field itself, to avoid discrepancies in the data collection and to ensure timely completion of field- work.

2.4 Data Entry and Analysis

The finding of the study is being presented in the tabular form containing absolute as well as relative values. The values of explanatory variables presented against the background variable in the tables. The quantitative finding of the study is corroborated and elaborated with the qualitative research finding. The data analysis plan is simple so that it can be understood easily.

2.5 Limitations of the study

The data base of the districts is very weak as such the organization has to struggle hard in contacts and communication to obtain secondary data. To cover about 3300 sample respondents spread over seven districts was a major bottleneck due to adverse weather conditions. Despite of limitations more directed efforts were put forth to quantify and bring this report.

Chapter – 3

Progress and Findings of the Study

Even though the pace of implementation under RKVY was not satisfactory in its first year of Implementation (i.e., during 2007-08), it has improved considerably since 2008-09. The concerned departments have shown more interest in implementation of the scheme in the State. The agriculture department is preparing detailed DAPs & SAPs and identified interventions that need to be taken up under RKVY as per the agro climatic requirements of the Districts.

3.1: Flow of funds under RKVY

Table 3.1: Flow of funds under RKVY

Sl.no.	Year	Allocation	Total Release (in Cr.)	Amount Utilized (in Cr.)
1	2007-08	7.00	6.37	6.37
2	2008-09	13.53	6.77	6.77
3	2009-10	24.68	24.68	24.68
4	2010-11	46.12	46.12	46.12
5	2011-12	20.44	20.44	20.44

So far in the last five years around Rs. 111.77 (in cr.) was allocated out of which Rs. 104.38 (in cr.) were being utilized.

3.2: Department –wise allocation of funds under RKVY (2007-08 to 2011-12)

Table 3.2: Department wise allocation of funds under RKVY (2007-08 to 2011-12)

Sl.no.	Department	Amount Allocated (in cr.)	Percentage (%)
1	Agriculture	57.42	33.0
2	Horticulture	28.47	16.0
3	Water Resources	8.34	5.0
4	Soil and Water Conservation	16.58	10.0
5	Fisheries	21.5	12.0
6	Animal husbandry & Veterinary	42.25	24.0
	Total	**174.56**	**100**

The table 3.2 shows approximately during the last five years an amount of 174.56 (in cr.) had been allocated to different departments, out of which around 33% of the fund is given to Agriculture department. As far as Water Resource department is considered they are getting the least.

As we know that the RKVY scheme is being implemented by different departments in the state, thus the achievements so far made under the scheme by different departments are given below:

a) **Water Resource Department -** Check dams, Pipeline and Distribution, Earthen Canal, Retaining wall, Pond and RCC wall.

b) **Soil and Water Conservation Department –** Peripheral Bund, Terracing, Seed and Manures, Check dams, Water harvesting structure, Erosion control, Diversion dam, Disposal channel, protection wall, Agro-horticulture, Agro-forestry, Adoption of Integrated Farming System (IFS) for providing sustainable livelihood opportunities like distribution of piggery/ poultry/ pisciculture/ apiculture/ kitchen gardening etc.

c) **Agriculture Department** - Surface water pumping, Mini check dams, Land development.

d) **Horticulture Department** - Strengthening of Horticulture hubs, Post harvest management and subsidy to SHG, Carnation and low cost poly house, construction of farmers training centre.

e) **Fisheries Department –** Area expansion of pond, supply of fish seeds.

f) **Animal husbandry and Veterinary department -** Establishment of veterinary dispensaries, Community livestock farming etc.

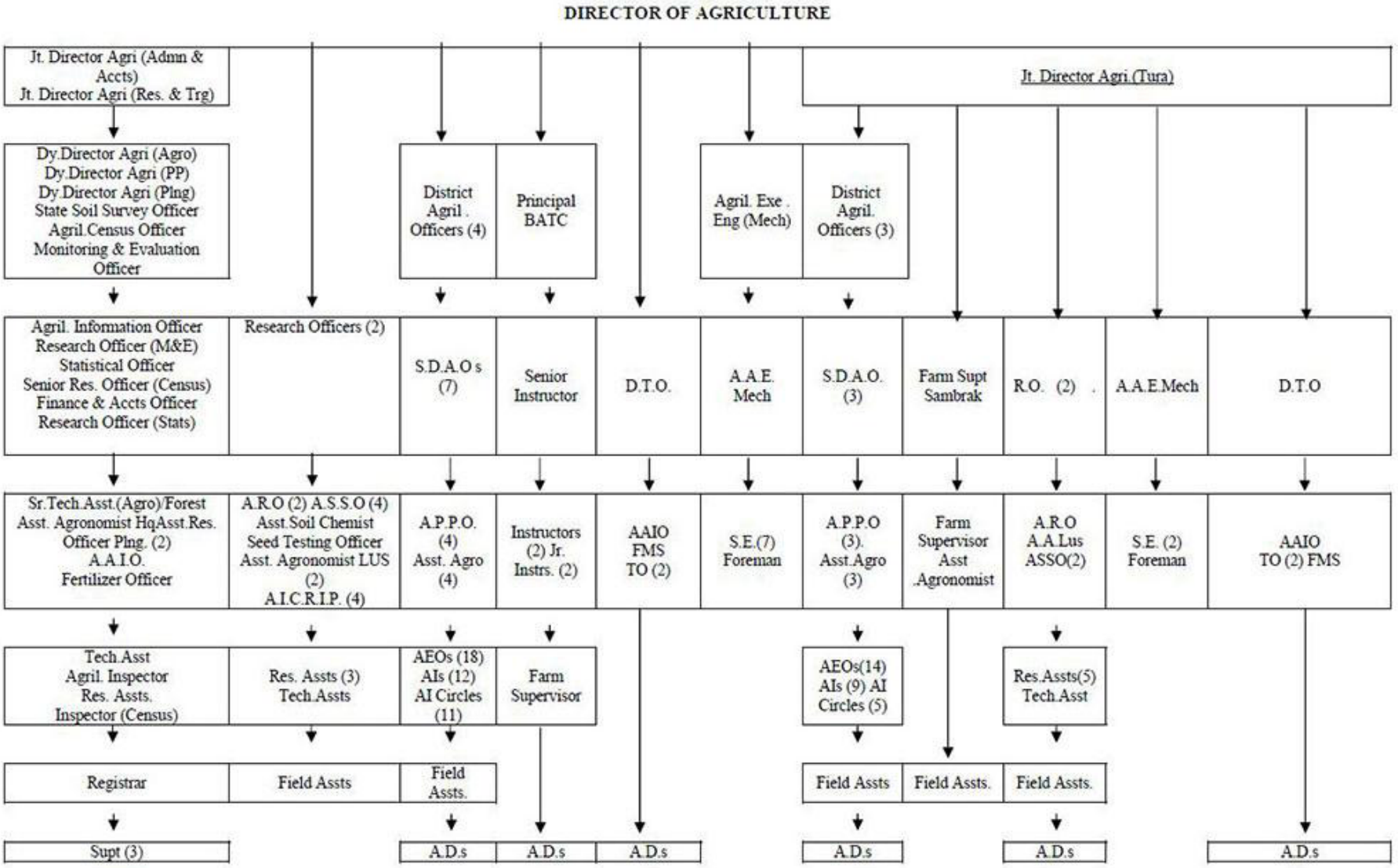
Agriculture Department

The Department of Agriculture was created in 1882 as the Department of Agriculture, Assam. However on attaining statehood it was bifurcated and renamed as the Department of Agriculture, Meghalaya. The Department of Agriculture, Meghalaya has been functioning as an integrated entity comprising the various spheres of development in Agriculture, Horticulture and Minor Irrigation. The mandate of the department is to bring about increased crop production and productivity.

The Directorate formulates various schemes for harnessing the potential of human and natural resources available in the State, for which active participation of the farming community in the implementation is of utmost importance.

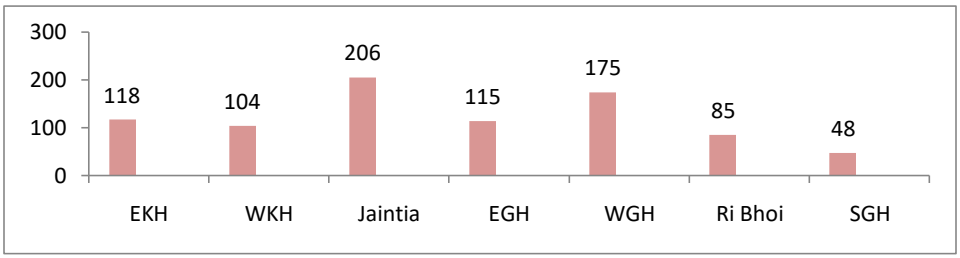
Rashtriya Krishi Vikas Yojana (RKVY) which is the Flagship programme of the Government of India is being implemented in the state of Meghalaya through the Department of Agriculture as the Nodal Department with the main aim of enhancing growth in Agriculture and Allied sectors. This is an integrated programme to bring about all round development in agriculture through sub-sectors namely Agriculture, Horticulture, Irrigation, Animal Husbandry and Veterinary, Soil and Water Conservation, and Co-operation. So far under Agriculture sector, Soil and water Conservation sector and Irrigation sector, the thrust is for land development, creation of water sources and farm mechanisation to bring more areas under cultivation as well as increase the cropping intensity of the state. On Horticulture sub-sector effort is on encouragement of cultivation of high value low volume crops through Hubs and Spokes Model. On Fisheries sector and Animal Husbandry & Veterinary sector, the objective is to reduce the increasing demand of fish and meat import from other states and also to meet the nutritional demand through fish and meat. On the other hand the Co-operation Department assists the Animal Husbandry and veterinary sector in dairy farming.

ORGANIZATIONAL SET UP **DIRECTORATE OF AGRICULTURE**



3.3: District-wise no. of Irrigation Check Dams constructed under RKVY

Table 3.3: District-wise no. of Irrigation Check Dams constructed under RKVY (2007-08 to 2012-13)



During the evaluation study it was found that the Agriculture Department has focused mostly on the construction of check dams in each district. A total of 851 mini-check dams have been constructed by Agriculture Department and these dams directly benefitted to the 1662 beneficiaries as per data provided. However, during the field visits in each district, out of the total sampled beneficiaries covered under this department, 60% reported that they have benefitted with the irrigation check dams. For some of the beneficiaries, construction of check dams have proved to be a boon that used to depend upon rain fed agriculture. As it is shown from the above chart that the maximum numbers of irrigation check dams were constructed in Jaintia Hills while the least are in South Garo Hills district.

The maximum no. of beneficiaries were benefitted from check dams in Janitia hill district of Meghalaya which is shown in the below table. During the visit in Janitia hill district it is revealed that in the Janitia hill district the most benefitted block from check dams under command area in ha. is Thadlaskein block. In this block while interviewing one of the most benefitted beneficiary Smt Rina shylla , who revealed that the check dam benefitted them in command area of 13 hectare and under this not only her family but four other families were benefitted with this check dam. After this block, Amlarem block of janitia hills was found to be most benefitted with the construction of check dams under RKVY.

During field visit it was found that the most of the dams have rusted due to landslides. This was major setback found. Theses dams are still in the same condition because there is no provision for repair and maintenance.

3.4: Details on command area and farmers benefitted

Table 3.4: Details on command area and farmers benefitted

District	Dams* (in nos.)	Area Covered (in ha.)	Beneficiaries (in nos.)	Status (nos.)	
				Operational	Non-operational
West Khasi Hills	104	204	188	104	0
East Khasi Hills	118	190	176	118	0
Jaintia Hills	206	309	440	206	0
East Garo Hills	115	173	230	115	0
West Garo Hills	175	280	375	175	0
Ri Bhoi	85	128	150	85	0
South Garo Hills	48	113	103	48	0
Grand Total	**851**	**1397**	**1662**	**851**	0

Note: * From each dam maximum no. of farmers benefitted is in between 2-3 approx, Average command area of each dam is about 1.5 ha.

* There are in total 851 mini-check dams in the State and all the projects are operational effectively. All the districts in the State varied in number in carrying out the irrigational projects. Therefore, it is visible form the above table that all the irrigational projects are 100% functional in the state.

3.5 Potential outcome of check dams

The check dams have facilitated agriculture in the districts, which is evident from the increase in area under cultivation. The check dams have also contributed to an increase in the area under irrigation. The check dams have lead to expansion in the present cultivable area and also increase in the yield and production of crops to some extent. The small Check-dam at Individual level has helped a lot in maintaining water level in the field, thus helped increase the grain yield.

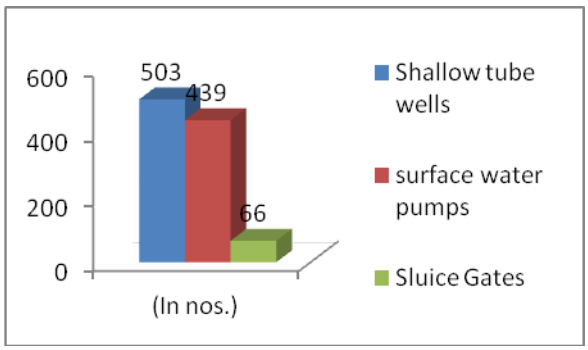
Impact on agriculture production: Due to the availability of water almost year round, most farmers in the village are able to grow second and some even three crops in a year. Thus farmers are now able to earn more than double of what they were earning from agriculture earlier. The improvement in agriculture production has also brought about improvement in agriculture practices. About 80 per cent of the farmers have started using organic manure (vermi compost) instead of chemical fertilizers. The productivity of crops has also increased due to the improved practices.

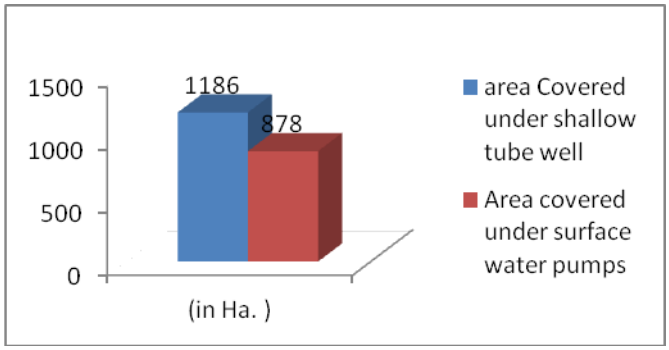
The overall impact of watershed projects under the RKVY has been positive and significant. Crop yields have risen and there has been a substantial increase in area under cultivation in the Rabi season, leading to rise in employment and reduction in migration of labour. Distress migration in the village has therefore reduced by more than 20 per cent. Improved incomes, diversification in agriculture and afforestation has all resulted in better resilience to drought among the farmers in the village. There has been a marked improvement in the access to drinking water in the village. Availability of fodder has also improved leading to a rise in the yield of milk.

Table 3.5: Details on command area and potential created

District	Dams (in nos.)	Command Area (in ha.)	Potential Created (in ha.)
West Khasi Hills	104	204	204
East Khasi Hills	118	190	190
Jaintia Hills	206	309	309
East Garo Hills	115	173	173
West Garo Hills	175	280	280
Ri Bhoi	85	128	128
South Garo Hills	48	113	113
Grand Total	**851**	**1397**	**1397**

3.6: Details on no. of shallow tube wells / surface water pumps/ sluice gates constructed under RKVY





Apart from construction of irrigation check dams, Agriculture Department is also involved in establishment of shallow tube wells, surface water pumps, land development etc. in the state. The land development in particular in border areas has helped in converting waste land in to cultivable land. So far approximately around 593 shallow tube wells and 439 surface water pumps are constructed. The area covered under shallow tube wells is 1186 ha. and under surface water pumps the area covered is 878 ha. The shallow tube wells have helped in providing irrigation water to small scale farmers in the state. Till now 66 sluice gates are constructed out of which many of them are not in a good shape. In most of the visited area it has got rusted.

3.7: Profile of sampled beneficiaries in different districts

Table 3.6: Profile of sampled beneficiaries in different districts

Sl. No	Districts	Average (Land Holding) (Acres)	Education (%)		(%) Age		
			Literate	Illiterate	Young (up to 30 yrs)	Middle (31 – 50yrs.)	Old (51 yrs & above)
1	East Khasi Hills	1.5	5.0	95.0	15.0	75.0	10.0
2	Jaintia Hills	2.0	12.5	87.5	20.0	60.0	20.0
3	Ri Bhoi	1.6	19.0	81.0	15.0	65.0	20.0
4	West Khasi Hills	2.2	10.5	89.5	30.0	65.0	5.0
5	West Garo Hills	2.3	15.8	84.2	21.5	75.0	3.5
6	East Garo Hills	1.8	20.0	80.0	18.0	75.5	6.5
7	South Garo Hills	0.5	15.0	85.0	18.0	70.8	6.0

The average land holding is around 1.5 acres comprising all the seven districts in the state. The lowest average land holders are from South Garo Hills district which is around 0.5 acres. The literacy level of the beneficiaries is also not satisfactory. Most of the beneficiaries involved in the farming are from middle age group, while rests of them are from young age group. The marginalization of farmers is a dominant factor adversely affecting household income. As we know, most of the operational holdings are below 1.5 ha the size of operational holding is very small. Such small holdings are uneconomic and results in under-investment in agriculture leading to low input use and low production.

3.8 Awareness about RKVY programme

Before closing the chapter we provide some details about households' awareness level about the RKVY programme and from where they obtained information about the programme. Table 4.17 provides details on percentage of household awareness about the RKVY programme. Although we surveyed only the beneficiary households under RKVY programme but we could observe that out of the selected beneficiaries around 49 per cent had some knowledge or they had heard about the RKVY programme before accessing the subsidy.

Table 3.7: Awareness about RKVY programme

Sl. No.	Source of awareness	% to total sample
1	% Beneficiaries who are aware about RKVY	48.9
2	News Paper	9.7
3	Agriculture department	69.7
4	SAU	4.0
5	KVK	0.0
6	KSK	0.6
7	Friends	5.7
8	input suppliers	0.0
9	TV / Radio	0.6
10	Agri. Exhibitions	1.7
11	ZP / TP /GP	2.9
12	Other Sources	5.1
13	Know about RKVY, but source not mentioned	0.0
Source: Field survey data.		

Majority of the beneficiaries even after availing the subsidy were not aware that they have obtained subsidy under the RKVY programme. We approached those households only on the basis of having the list of RKVY beneficiaries otherwise it would have been difficult to collect information from them as they were not able to identify themselves as beneficiary of RKVY programme due to multiplicity of programmes being implemented in agriculture sector having subsidy element. In most of the cases, households accessed the concerned departments that provided input or subsidy under RKVY programme through the agriculture assistant/ someone else.

3.9 Feedback, Success Story and Social Impact

Agriculture is the mainstay of the people of the village. Except for a handful of farmers, the rest are marginal cultivator of broomstick, ginger, banana, pumpkin and jackfruits. The general living condition of the farmers is very poor and hence different projects were taken up with the main objective to uplift the socio-economic condition of the villagers by creating job opportunities and also help them sustain themselves in the near future. Out of the several projects taken up, one particular proved to be a success story of which is detailed below:

1. Check Dams: Satigre Village

An Irrigation Check Dam was constructed at Satigre village under RKVY during the year 2012-13 across the Agachi stream. The village is located about 50 kms away from Tura and falls under the Dadenggiri C & RD block. The total area of the village is approximately 400 ha.

Agriculture is the mainstay of the people of the village. Except for a handful of farmers, the rest are marginal cultivators of paddy, broomstick, ginger, banana, pumpkin and jackfruit. The general living condition of the farmers is also very poor. Though the region receives bountiful rainfall during the monsoons, due to the undulating topography of the area coupled with Shifting cultivation, the top soil has been eroded resulting in poor soil condition. This in turn, has resulted in low crop productivity.

Keeping this in mind, the Office of the District Agriculture Officer, West Garo Hills, Tura decided to take up the construction of an Irrigation Check Dam with the main objective to uplift the socio-economic condition of the villagers by creating job opportunities and also to help them sustain themselves in the near future. The main objectives of this particular project were to:

1. Provide water for irrigation.
2. Control soil erosion and gully formation.
3. Improve the socio- economic condition of the villagers.

Before the commencement of this project, only 6 ha area was under Sali Paddy but on completion, an additional 24 ha was brought under this crop, bringing the total area under paddy to 30 ha. In addition, a total of 21 households are directly benefitted by this project.

It was also observed that soil erosion and gully formation in the channel has been greatly reduced and the sediments and pollutants have been allowed to settle. The structure also stores surface water for use both during the monsoon and later during the dry season and helps in ground water recharge, thereby raising the water table in the area. Availability of water ensures the increase of agricultural yield by double-cropping.

A View of the Irrigation Check Dam

A View of the Irrigation Channel

The distinctive feature of this check dam is that a 300 m long water channel (50 m Pucca + 250 m Kuccha) has been constructed which provides irrigation water straight to the paddy field. Double cropping has also been made possible and an additional 6-7 ha of Boro paddy can now be cultivated by the villagers after the main Sali paddy crop. Moreover, the farmers have also started to take up cultivation of Maize, Black Gram and Lentil. This has thus led to an increase in the Cropping Intensity. The check dam also prevents erosion of the fertile top soil thereby improving soil fertility. This coupled with assured irrigation facilities has led to an increase in the productivity of lowland paddy (Based on Crop Cutting Experiments) and farmer incomes as shown in the table below:

Sl. No.	Crop	Yield (qtl./ha)	
		Pre-project	Post-project
1.	Lowland Paddy	50	75

Sl. No.	Crop	Income (Rs.) @ Rs. 12,500/qtl.	
		Pre-project	Post-project
1.	Lowland Paddy	6,25,000	9,37,500

Thus an additional yield of 25 qtl was obtained during the post-project period which works out to an additional profit of Rs. 3,12,500.

With the implementation of this RKVY project, farmers no longer have to depend on rain water for the success of the plantations. The agricultural productivity as such has improved immensely as a result of the increased land under cultivation, improved land quality and enhanced irrigation facilities throughout the year. This has resulted in an overall increase of household incomes and better standard of living.

This project has also greatly helped in the capacity building of the people since their knowledge and skills were enhanced and at the same time their perspectives broadened thereby becoming more effective in performing their roles and responsibilities, thus proving to be a success story.

Flourishing Paddy Cultivation due to Assured Irrigation

2. Check Dams: Haribanga Village

The construction of the check dam was taken up in the year 2012-13 at Haribanga Village under Tikrikilla C & RD Block. The main objectives of this particular project were to:

1. Provide water for irrigation and pisciculture.
2. Control soil erosion and gully formation.
3. Improve the socio- economic condition of the villagers.

Though the region receives bountiful rainfall during the monsoons, due to the undulating topography of the area coupled with Shifting cultivation, the top soil has been eroded resulting in poor soil condition. But with the construction of this check dam, soil erosion and gully formation in the channel has been greatly reduced and the sediments and pollutants have been allowed to settle.


PUCCA CHECK DAM AT HARIBANGA

A view of the Completed Check dam. (L = 19 m, B = 2.6 m, H= 3.75 m)

PUCCA CANAL 385 M

The structure also stores surface water for use both during the monsoon and later during the dry season and helps in ground water recharge, thereby raising the water table in the area. Availability of water ensures the increase of agricultural yield by double-cropping. The Check dam has also brought bounty to the people since it is used not only as a rain water harvesting structure, but also for Pisciculture and other domestic uses.

The distinctive feature of this check dam is that a 950 m long water channel (100 m Pucca + 385 m Kuccha) has been constructed which provides irrigation water straight to the main Paddy field. It has also made double cropping possible since water is available during dry season thus 5-6 ha of Boro paddy can now be cultivated by the villagers after the main Sali paddy crop. This has thus led to an increase in the Cropping Intensity. The check dam also prevents erosion of the fertile

top soil thereby improving soil fertility. This coupled with assured irrigation facilities has led to an increase in the productivity of lowland paddy and cash crops as shown in the table below:

Sl.No.	Crop	Area/Ha	
		Pre-project	Post-project
1.	Lowland Paddy	15	20-21
2.	Lentil	5	7
3.	Blackgram	4	5
4.	Maize	2	2.5

SRI CULTIVATION

SHOWING CROP CONDITION

With the implementation of this project, farmers no longer have to depend on rain water for the success of the plantations. The agricultural productivity as such has improved immensely as a result of the increased land under cultivation, improved land quality and enhanced irrigation facilities throughout the year. This has resulted in an overall increase of household incomes and better standard of living.

This project has also greatly helped in the capacity building of the people since their knowledge and skills were enhanced and at the same time their perspectives broadened thereby becoming more effective in performing their roles and responsibilities.

Another significant aspect of this project is that the villagers played a very proactive role in providing valuable suggestions on the design and construction of the dam. This micro-level involvement has provided people with an opportunity of learning to manage such assets and also given them the confidence that they can now ensure for themselves a secure and sustainable livelihood both in the present and as well as in the future. With the need of Farmers the Scheme has been proposed under RKVY Scheme and the Government helped the poor farmers through this purposeful Scheme. Community participation thus has been the key to the success of the check dam under R.K.V.Y Scheme.

3. Check Dams: Rangsakhona village

The cultivable area under Rangsakhona village for construction check dam is 17 Ha. In this village the irrigation check dam and pucca canal have constructed across the perennial stream named Koidol stream during the year 2012-12, at the total cost of Rs. 20,47,350.00 (Rupees twenty lakhs forty seven thousand three hundred fifty) only and the amount has been met largely form RKVY. There used to be severe water stress during Kharif earlier. Earlier farmers from the respective area used to take paddy and maize during Kharif season. In Rabi season, agriculture was almost negligible and only Rabi vegetables were grown with very low production. Now farmers are in a position to raise crops without interruption in areas where check dam have been constructed. Farmers of Rangsakhona village are benefitted. Maximum area has been converted into irrigated land. The cropping system has since changed rapidly. Before constructions the main crops were rainfed. Due to the irrigation made possible after construction the productivity of Boro paddy and other crops has increased.

Benefitted farmers have given a feed back that due to construction of this structure the area has also increased and they are enjoying higher income due to increase production for example Smt. Zelda Sangma, a genuine farmer from Rangsakhona cultivated Ahu paddy in 10 bighas, the yield she obtained before construction was 48 qtls/ha and the yield after construction goes 64qtl/ha. It is anticipated that 15-20% increase occurs by virtue of providing irrigation. The overall state of production and productivity of the crops has recorded significant increase since implementation of the RKVY intervention. After construction of the check dam not only was paddy cultivation ensured with increased production but Rabi and summer cultivation also came into regular practice.

This reflects the wisdom of our forefather who had made water harvesting and water management as integral part of community life and these practices were performed by the common man and his community as their duty and social responsibilities and part of good local self-governance. The need of the hour is to revive the age-old practices of community based water management for the benefit and progress of our people. The scheme has contributed a lot to achieve enhanced growth rate in Agriculture and Allied sector.


Check Dam at Rangsakhona

Paddy Cultivated at Rangsakhona

Maize Cultivation

4. Check Dams: Bhajamara village

Bhajamara village falls under Selsella Development Block and is situated 56 kms from Tura, the headquarters of West Garo Hills District. The region is rich in clay-loam soil and receives a share of moderate rainfall. The Hajongs make up a majority in the village and farming is their mainstay; paddy being the main crop cultivated. The area under paddy will be around 200 Ha. Double cropping is also taken up by the farmers in paddy fields wherever feasible. Initially, Boro paddy covered an area of 3 Ha with an average yield of 45 quintals/Ha only.

Accordingly, with a view to increase the area of Boro paddy and to uplift the socio-economic conditions of the farming community from Bhajamara, the Office of the District Agriculture Officer, West Garo Hills constructed an Irrigation Check Dam at Bhajamara over Ganglu Stream under RKVY Scheme in the year 2011-12. 78 (Seventy-eight) farmers benefitted from this irrigation dam subsequently increasing the Boro paddy area from 3 Ha to 50 Ha in the village.

The dam was constructed according to the layout plan with a length of 15 metres and a height of 6 metres. Canals were also constructed on both sides of the dam. A 100 metre Kuccha canal was made in addition to a 50 metre Pucca canal which provides irrigation water to the neighbouring paddy fields.

With the completion of the dam, the people of Bhajamara are elated and more farmers have taken up Boro paddy cultivation in addition to Sali paddy. The yield of Boro paddy has also increased from 45 Quintals/Ha to 70 Quintals/Ha. The excess yield is being sold at nearby local markets thus increasing the income of the farming community of Bhajamara. SRI and Line Sowing have also been demonstrated to the farmers so as to further increase their crop yields.


Irrigation Check Dam at Bhajamara

Line Sowing Demonstration

Boro paddy cultivation at Bhajamara

With the implementation of this scheme, farmers no longer have to depend on rain water for their paddy cultivation. The agricultural productivity as such has improved immensely as a result of the improved land quality and enhanced irrigation facilities throughout the year. This has resulted in an overall increase of household incomes and better standard of living, thus, proving to be a success story.

5. SHALLOW TUBE WELLS AT GARODUBI VILLAGE, SELSELLA C & RD BLOCK

Rashtriya Krishi Vikas Yojana (RKVY) is being implemented in West Garo Hills like in other Districts of Meghalaya and the district can boast of having the most areas under paddy as compared to the other districts. Productivity of rice is also more in West Garo Hills and hence, can rightly be said as the 'Rice Bowl' of Meghalaya. Under this scheme, the Office of the District Agriculture Officer, West Garo Hills has also distributed Shallow Tube Well (STW) installation sets along with pumpsets of 5 H.P. to the farmers occupying the plain belts of West Garo Hills.

The plain belt of West Garo Hills is a part of the Brahmaputra Valley and is inundated by floods every year. Garodubi, a village under Selsella C & RD Block is one such village where many crops are grown all the year round. But due to scarcity of water, cultivation of Boro paddy was a distant vision for the agricultural farmers. However, with the installation of these STWs under RKVY it has become possible for the farmers to grow Boro paddy successfully.

Farmers using the installed Shallow Tube Wells to irrigate their fields

Under this scheme, a total of 5 units of STWs were installed in the village Garodubi covering an area of 7.5 Ha approximately. Productivity of cereals and other crops like pulses, oilseeds and vegetables were low before the installation of these STWs, but after the

implementation of this scheme, the production has doubled as the farmers are incorporating latest technologies like SRI, Line Sowing etc. in their farming system. As the production has gone up, the economic condition and livelihood of the farmers have also improved much better.

6. Check Dams: Nengja Village

An Irrigation Check Dam was constructed at Nengja Bolchugre Village across the Asim Stream, under R.K.V.Y. 2009-10. The village is located about 30 kilometres from the District Headquarter at Tura, and falls under Gambegre C&RD Block.

The people of this village are predominantly dependent on farming, of both Agriculture and Horticulture Crops. All farming activities are extensively dependent on rain, most of which are received during the Monsoon Season. A large portion of the Annual Rainfall is received only for a short spell during the months of June, July and August. Due to the hilly nature of the area's topography, most of the rain water received during this spell is also lost in the form of surface run-off, due to the absence of water-retaining structures. As such, despite receiving a good quantity of rainfall, the area experiences a considerably long dry spell for the rest of the year stretching towards the start of the following year.

In addition to the loss of such great quantity of rain water, the intense rain poses another danger in the form of soil erosion and damage to top-soil, due to high velocity of surface run-off. In view of all these factors, it was decided to take up the construction of a Check Dam in this village under this Scheme, with the main objectives as follows:-

1. To retain as much rain water as possible in the area, during and after the Monsoon Season.
2. To provide Irrigation to surrounding cropped areas.
3. To facilitate the replenishment of nearby groundwater reserves and wells, and thereby to increase the Water Table of the area in general.
4. To control Soil Erosion, prevent damage of top-soil, prevent gully formation, etc.

Before this project, only around 5 Hectares area was under Sali Paddy. This Project has helped in expanding the area under Sali Paddy to around 20 Hectares, and around 5 Hectares under Vegetable Cultivation. Due to reduced soil erosion, and better water-retaining capacity of the soil, and also rise in the Water Table of the area, the fertility and productivity of the soil has also greatly increased.

As a result, more farmers are engaging themselves to farming, which in turn has resulted in the overall increase in their earning capacities, and also a great improvement has been observed in the living standards of the people of this village as a whole.

7. Shallow tube well at Koraigora and Upper Puksora

The Department also took another step for providing irrigation facilities to the boro paddy growers through construction of Shallow Tubewells (STW). A number of STWs have been constructed under this scheme. An example of this kind is seen in the village of Koraigora where the farmers have taken up boro paddy in a large scale. Each STW covers an area of 2 ha under boro cultivation. The water runs throughout the day irrigating the paddy field. Seeing the potentiality of the irrigation water about ten numbers of farmers have come up for cultivation of boro paddy during 2012-13.

Shallow Tube Well at Koraigora

Cultivated field at Koraigora

Shallow Tube Well at Upper Puksora

8. Sluice Gate at Rajai

The village has a perennial source of water throughout the year but the farmers grow paddy only once a year. The Department after the survey has made proposed for the construction of a Sluice Gate for irrigating a huge area under boro paddy at this village. Previously, there was not enough irrigation facility for boro paddy cultivation. The construction of this Sluice gate paved a way for a much better and huge coverage of irrigation in the paddy field during the lean season for 10 Ha. A number of boro paddy growers have moved forward for cultivation of boro paddy seeing the potentiality of the source of irrigation available. The farmers have benefitted a lot and good responses have received from them by seeing the growing numbers of boro paddy cultivators.

Sluice Gate at Rajai

Cultivated field at Rajai

9. Saphai Minicheckdam/harvesting structure

This mini check dam was constructed at Saphai at the cost of Rs. 1.5 lakh with covering an area of about 2.5 ha and benefited about 4 numbers of Households. Saphai mini check dam also serve as a water harvesting structure for harvesting of rain water during rainy season. Before construction, farmers were not getting sufficient quantity of water for cultivation of paddy and other crop especially in the dry season as a result of which their production was very low about 1.4-1.8 Mt per ha. Now after completion of the mini-check dam benefited farmers/households were able to get sufficient quantity of water throughout the year and were able to increase their area of production to about 2.5 ha and the yield to about 2.4-3.1 Mt/ha. Moreover, they were also able to undergo second crop cultivation and fish culture as a result of which, increase their overall production and income generation.

Fig.Saphai Minicheckdam cum Harvesting structure

10. Umpynsnam Minicheckdam/harvesting structure

This mini-check dam was constructed at at Umpynsnam falls under Khliehtyrshi village at the cost of Rs. 1.1 lac with covering an area of about 1.8 ha and benefited about 3 numbers of Households. Khliehtyrshi mini-check dam also serve as a water harvesting structure for harvesting of rain water during rainy season. Before construction, farmers were not getting sufficient quantity of water for cultivation of paddy and other crop especially in the dry season as a result of which their production was very low. Now after completion of the mini check dam benefited farmers/households were able to get sufficient quantity of water throughout the year and were able to increase their area of production to about 1.8 ha. Moreover, they were also able to undergo

second crop cultivation and fish culture as a result of which, increase their overall production and income generation.



11. Ummalong Mini-check dam

This mini-check dam was constructed at Ummalong falls under Nongkynrih village at the cost of Rs. 1.5 lac with covering an area of about 3.2 ha and benefited about 3 numbers of Households. Before construction, farmers were not getting sufficient quantity of water for cultivation of paddy and other crop especially in the dry season as a result of which their production was very low. Now after completion of the mini check dam benefited farmers/households were able to get sufficient quantity of water throughout the year and were able to increase their area of production to about 3.2 ha. Moreover, they were also able to undergo second crop cultivation and fish culture as a result of which, increase their overall production and income generation.




12.CHECK DAM CUM RAIN WATER HARVESTING STRUCTURE

Name of Beneficiaries: - Shri.Stin Maring.

Estimate cost: - Rs. 1,59,400

Area benefited: - 4 Hectares.

Location – Umjong, Umling C&RD Block,

Year of Implementation – 2009-10

The construction of Check Dem with diverting Channel has been a great help to these beneficiaries especially during the barren season. With the construction of diverting channel the fields which are not irrigated in the previous year has received sufficient water supply.

Traditionally the farmers in this area use to practice Jhum cultivation but with the intervention of RKVY Scheme 2009-10 the farmers have started to gain vegetables and Boro paddy as well.

Name of the beneficiary – Shri. A.D Rapthap.

Location –Byrnihat

Area benefitted – 6 Ha

Estimated cost – Rs. 180,000.00

Year of Implementation – 2009-10

The farmer was largely dependent on rain for irrigation and he used the local method to construct the channel in order to irrigate the paddy field. As a consequence, the farmer faced a constraint during the dry period due to non availability of water. With the construction of this check dam the paddy field not only increased in production but he could also grows winter vegetables such as frenchbean, cabbage and capsicum. This has improved the economic status of the farmer due to extra income generated from these vegetables.

Name of the beneficiary - Shri. E.Nongbet

Location - Sohpdok, Umsning C & RD Block

Area benefitted - 5 Ha

Estimated amount - 3.4 Lakhs.

Year of Implementation – 2009-10

The construction of check dam at Sohpdok, has been of great help to Shri.E.Nongbet and a number of farmers cultivating near the check dam. In the previous years, paddy was the only

crop being cultivated by the farmers in the farm land. With the construction of this check dam under R.K.V.Y scheme, there is a great scope for multiple cropping. Now that there is sufficient water during the winter season, the beneficiary himself along with the neighboring farmers started vegetable cultivation. The main vegetable crop cultivated by the farmers are tomatoes, chilies and French bean. Vegetable cultivation has served as an additional income and as a whole has improved the socio-economic life of the farmers.

Shri.E. Nongbet along with the other farmers who are benefited from this check dam extend their sincere gratitude to the department for providing assistance to them in the field of agriculture. The contribution provided by the department has changed their socio economic status and they have offered their cooperation to the department in any activities related to agriculture in the future.

Name of the beneficiary : Shri. Donbor Rymbai,

Location - Liarkhla, Umsning, Block, Ri bhoi District.

Area benefited : 10 Ha

Estimated cost – Rs. 211,400.00

Year of Implementation – 2012-13

In the previous years, paddy was the only crop being cultivated by the farmers in the farm land. With the construction of this check dam under R.K.V.Y scheme, there is a great scope for multiple cropping. Now that there is sufficient water during the winter season, the beneficiary himself along with the neighboring farmers started vegetable cultivation. The main vegetable crops cultivated by the farmers are tomatoes, chilies and French bean. Vegetable cultivation has served as an additional income and as a whole has improved the socio-economic life of the farmers.

3.10 SWOT ANALYSIS

Strength	Weaknesses
❖ Check dams were constructed to provide incidental irrigation during late Khariff and Rabi by storing water at the end of monsoon mainly through lifting devices. ❖ Dams for Ground Water recharge. ❖ Irrigation use of water flowing down drainage channels. ❖ To divert water from perennial / semi-perennial streams in hilly areas for irrigation purpose. ❖ Other uses by villagers like bathing, washing, fishing, recreation etc. depending on location and potentiality. ❖ Shallow tube wells have contributed significantly to the increase in the level of input use and realization of higher yields and returns from crops. ❖ The provision of power tillers, improved power and manually operated farm implements and canopy management tools.	❖ Most of the dams have rusted due to landslides. ❖ Theses dams are still in the same condition because there is no provision for repair and maintenance. ❖ Shallow Tube Well is not feasible in Hilly areas due to low water level at the ground. ❖ Many of the visited areas sluice gates have got rusted due to hilly landslides. ❖ Less awareness about modernized farming methods.

Opportunities	Threat
❖ Agriculture is a top priority for which plans and policies are to be formulated for the benefit of farmers in the State. ❖ The agro-climate conditions in the hilly State is supportive to cultivation of a wide range of crops- the temperature varies from 2c to 362c depending on the altitude (300 to 2000 meters above sea-level) ❖ Large tracts of wasteland provide opportunity for extensive cultivation ❖ Sate targets to bring 42,000 ha of waste-land under cultivation ❖ Promotion of high value plantation crops under RKVY to limit the practice of shifting-cultivation	❖ Most of the operational holdings are below 1.5 ha, the size of operational holding is very small. Such small holdings are uneconomic and results in under-investment in agriculture leading to low input use and low production. ❖ The gap between State production of rice (2.17 lakh MT per annum, 2007-08) and estimated demand (3.60 lakhMT per annum) presents a food-security threat for the Sate having population growth rate higher than the national-average. ❖ Decline in the quality of forest

3.11 Recommendation/ suggestions:

- The irrigation check dams has helped in transforming the agriculture of the surrounding areas by holding the monsoonal rains for longer after they have stopped, still there is need for new and sustained irrigation techniques which will in turn prolong the crop growing season.
- Provision of corpus fund for maintenance and renovation of construction carried out under the scheme - There is an urgent need of provision for repair and maintenance of rusted dams in the districts of Meghalaya. As specified in the guideline of RKVY, no expenditure towards maintenance of assets can be funded under the programme.
- Increasing the cost norm from Rs. 1.5 Lakh/Ha to Rs. 2.5 Lakh/Ha – there is no such cost norm for the construction of check dams.
- There needs to be major focus for the construction of bank stabilization (retaining wall) in the paddy fields, to protect the paddy fields from being washed away during heavy rainfall. As far as till now the scheme is mainly focusing on construction of mini check dams, this may not lead to any major impact on productivity.

Promotion of Farm mechanization

Under the RKVY Scheme since inception till 2012-13, there isn't any step taken for promotion of farm mechanization. The agriculture department is providing subsidy for purchase of the farm machinaries, while the subsidy is not provide under RKVY.

Step taken by Agriculture Department for Promotion of Farm Mechanization

3.12 Present Scenario of Farm Mechanization :

Indian Agriculture is undergoing a gradual shift from dependence on human power and animal power to mechanical power. Mechanical power is largely consumed in big land holdings and is still beyond the reach of small / marginal holdings, as by virtue of their economic condition, the small/ marginal farmers are unable to own farm machinery on their own.

Therefore to bring farm machinery available within the reach of small / marginal farmers, the Department of Agriculture through its Mechanical Wing has been popularizing the use of Agricultural Machineries to the small / marginal farmers of the state. Through the various schemes being implemented by the Department, Agricultural Machineries such as Power Tillers, Tractors, JCBs, Bulldozers and Power Reapers were purchased by the Department for giving out to the farmers on hire at subsidized rates to reduce the input cost of production.

Loan-cum-Subsidy Scheme is also being implemented by the Department whereby farmers are being provided with subsidy for purchase of Agricultural Machineries such as Power Tillers, Power Reapers, Power Pumps for Irrigation purpose, etc. Demonstrations of new and improved machineries are also being conducted by the Department in collaboration with the Dealers to ascertain the machine's operational feasibility as well as acceptability.

The present mechanization status in the state is among the least in the country. Therefore, to assist the farmers in getting maximum returns from their land, mechanized activities have to be expanded specially in places with low farm power activity.

Farming practices by the locals:

1. **Paddy:-** Earlier the local farmers adopt the broad casting method of paddy cultivation where no specific spacing is maintained. In this method the cost of cultivation and the yield per hectare is less. But after conducting of demonstrations, the farmers realized that by transplanting or line sowing, the yield is high though cost of cultivation is higher. Now the farmers adopt only the transplanting method of rice cultivation.
2. **Citrus (Orange)**-Propagated by seeds.
3. **Pineapple**- Propagated by suckers and crowns.
4. **Potato**- Propagated by tubers.

3.13 Status of the Promotion of farm mechanism Schemes :

Total No. of Agricultural Machineries provided to the farmers of the State under Subsidy Scheme:-

Machines	Power Tiller	Power Reaper	Pump sets	Rice Huller	Paddy Thresher	Winnower	Brush Cutter
Numbers	3456	367	575	250	57	385	518

Total No. of Agricultural Machineries hired out to the farmers of the state:-

Machines	Power Tiller	Tractor	Power Reaper	JCB	Bulldozer	Truck
Numbers	156	15	32	2	3	2

- The main objective of the Scheme is to bring farm machinery within the reach of small and marginal farmers of the state by popularizing the use of Agricultural Machineries such as Power Tillers, Tractors, Bulldozers, Power Reapers, Power Pumps, Paddy Threshers, etc. which is necessary in view of the scarcity of farm labour as well as to promote farm mechanization in the state, thereby facilitating efficient use of resources and timeliness of agricultural operations.
- This scheme aims at supplementing the Agriculture Engineering (Mechanical) Plan Scheme whereby repairing infrastructures are being created within the Department to maintain the Agricultural Machineries that are being hired out to the farmers of the state.

- The Scheme aims at assisting the small and marginal farmers of the State by providing Power Tillers at subsidized rates, thereby increasing production and productivity as well as uplifts the economic condition of the farmers.

3.14 Impact of the Scheme:

- Through this Scheme, Agricultural Machineries were purchased by the Department for giving out to the farmers on hire at 60% subsidized rates, to reduce the input cost of production and also to ensure that the farmers get maximum returns from their land. The implementation of the scheme has greatly benefited the small and marginal farmers of the State who by virtue of their economic condition are unable to purchase Agricultural Machineries on their own. As the present mechanization status in the State is among the least in the country, such mechanized activities have to be expanded, especially in places with low farm power availability.
- Subsequent to the implementation of the Agricultural Engineering (Mechanical) Plan Scheme where Agricultural Machineries such as Power Tillers, Power Reapers, Tractors, Bulldozers, JCB etc. were purchased by the Department for giving out to the farmers on hire at subsidized rates, the necessity to create the infrastructure for housing and repairing of such machineries within the Department is also found necessary to maintain them so as to ensure their operational worthiness and longevity. Hence, the creation of such infrastructures to maintain the agricultural machineries is necessary keeping in mind the huge demand for such machineries from the farming community.
- Agricultural Mechanization helps in increasing production, productivity and profitability in agriculture. Meghalaya being a hilly state and due to its undulating terrain, Power Tillers serves as a key intervention in farming operations. It has also become an integral part of tillage operations in the state due to its topography, small land holdings, ease of operations as well as efficient management of time and resources.

3.15 Creation of Farmer's Field School (FFS)

Farmer's Field School (FFS) is based on the concept of on people – centered learning and was developed as a supplement to the conventional extension approach. It uses innovative and participatory method to create a learning environment in which the farmers have the opportunity to learn for themselves about the particular crop production problems and ways to address them, through their own observation, discussion and participation in practical learning through field exercises. The approach is now being used to enable farmers to investigate and overcome a wide range of issues including soil productivity improvement, conservation agriculture, control of surface run off, water harvesting and improved irrigation. The FFS approach was initially developed for training of rice farmers in integrated pest management, but new programmes and projects have been introduced to improve and expand the FFS curriculum.

The farmers meet every week, from planting time to harvest, to check on how the crops are growing, monitor predators and conduct other important observations. The facilitator in Farmers' Field School is normally an Extension Worker or another farmer who has graduated from another field school. The facilitator guides the group, helps the members decide what they want to learn, helps them think of possible solutions and answers questions they raise. The farmers draw on their own experience and observation and make decisions about how to manage the crop. The group organizes *'field days'* to show other farmers what and how they are doing. The Field School includes team building and organizes skills, as well as special topics suggested by the members themselves. The field schools are means for farming communities to improve their decision-making and to stimulate local innovation for sustainable agriculture. The emphasis is on empowering farmers with technical guidance to implement their own decisions in their own field.

3.16 Future Prospects of Farm Mechanization :

There is a growing trend of rural population migrating to the urban areas to earn their living, leading to a huge shortfall in labour required for agricultural activities. Due to this reason, farmers are now turning to Farm Mechanization to fill up this gap.

The Department also realizing the need to enhance Farm Mechanization domestically has through the Mechanical Wing undertaken steps to promote the usage of farm machinery by domestic farmers. This is being taken up under the central programme called Sub-Mission on Agricultural Mechanization (SMAM). Under this programme, farmers are being encouraged to purchase Agricultural Machineries at subsidized rates. Demonstrations of new and improved machineries are also being conducted by the Department at the Farmers Field for the purpose of creating awareness as well as to encourage usage of such machineries.

Considering the shortfall of farm labour, coupled with the increasing inclination of farmers towards farm mechanization as a result of State/Central Government's assistance, we can say that the future prospects of Farm Mechanization in the State is very encouraging.

3.17 Scope of Improvement :

The main impediments for Farm Mechanization in the State are:-

- Small and fragmented land holdings
- High cost of farm equipment ownership
- Lack of credible financing options for domestic farmers

The overall land holding in the State is fragmented. A large proportion of this land is held by small and marginal farmers who by virtue of their economic condition are unable to purchase farm machinery on their own. This can be addressed only if the State/Central Government increases their share of assistance to the farmers. Steps must also be taken to ensure that the financial institutions simplify their process for providing assistance to farmers in need of loan for purchase of agricultural machineries.

Horticulture Department

The Directorate of Horticulture was created in 1995. Meghalaya offers an excellent scope for growing of different types of horticultural crops including Fruits, Vegetables, Spices, Plantation crops, Medicinal and Aromatic plants of high economic value. A wide range of tropical, sub- tropical and temperate fruits such as Mandarin Orange, Pineapple, Banana, Lemon, Guava, Pear, Plum etc. are grown all over the State. A large variety of fruits & vegetables, both indigenous and exotic are grown across a wide range of agro climatic zones. The higher altitudes provides conducive ecosystem to grow traditional vegetables like Potato and Cole crops during the rainy season.

The department has successfully set up Horticulture Hubs in all the seven districts of the State with specialization in flowers and high value vegetables. Each horti hubs is served by spokes comprising collection centres and crop clusters of surrounding villages within a radius of 10 Km. The State is organic by tradition and the Directorate has taken steps to introduce organic certification on select horticultural crops. Use of Green house technology, poly-houses, drip and micro irrigation system, water harvesting structures, fustigation, soilless culture are being popularized in order to minimize risk and help farmers overcome the vagaries of nature as well as to standardize quality of produce and reduce economic losses. Post harvest management, value addition, processing and marketing are the other priority areas.

Under the RKVY scheme the department is undertaking the following activities:

a) Area expansion of colored capsicum and roses
b) Turmeric processing units
c) Reefers, cool rooms, pre-coolers
d) Strengthening of horticulture hubs
e) Post harvest management and subsidy to SHG
f) Carnation spoke and low cost poly house
g) Construction of farmers' hostel

The Directorate of Horticulture has also identified floriculture clusters in the State which are suitable for growing certain high value flowers. East Khasi Hills have been identified for Orchids,

Carnations and Gerbera; West Khasi Hills for Carnations; Jaintia Hills for Bird of Paradise; Ri-Bhoi for Orchid, Rose, Anthurium, Lilium and Foliage; West Garo Hills for Liliums and Bird of Paradise; East Garo Hills for Anthurium, Foliage and Bird of Paradise. At present, East Khasi Hills, East Garo Hills and Ri-Bhoi districts have established green house floriculture units in the departmental farms as well as in farmer's field. The estimated area under floriculture in the State is about 500 Hectares.

The State has also improved from its earlier overall 5th position during 2006 to becoming 1st among North Eastern States (except Assam which is categorized as a big State) during 2007. This goes on to show that agriculture, specially horticulture in Meghalaya is on a growth trajectory and the State only needs a boost in resources, better post harvest management, marketing linkages, organized marketing and creation of economy of scale in order to accelerate it to the take off stage. With the right policies of the State Government and adequate fund injection through the Technology Mission for Horticulture Development along with farmer's and entrepreneurs of the State coming forward to take up commercial floriculture, Meghalaya will not be lagging behind and the vision articulated by the Department of Agriculture will hopefully, flower and bloom in its full glory and beauty.

The Agri-Horticultural Society, Shillong aided by the Department of Agriculture also organizes flower show and flower competition in Shillong to promote floriculture. This became an annual event and has brought a lot of awareness to the public about modern floriculture practices and marketing prospects.

3.18 Types of infrastructure provided for the growers

Types of infrastructure provided for the growers for cultivation of different horticulture crops including floriculture – the infrastructure provided to the farmers/ entrepreneurs at the spokes around the Horticulture Hubs are

1. Low cost polyhouses/ net houses small in size 100-200 sq m for production of flowers
2. Low cost tunnels for production of vegetables especially winter vegetables by providing insulation against cold and providing physical protection from frost, sleet, rain etc.
3. Hi tech Polyhouses/ infrastructure for production of Carnation, Anthurium and Roses. These include Drip irrigation system and other components as well. These sizes are >200 sqm.

3.19 Impact of infrastructure/subsidy support

Impact of infrastructure/subsidy support for cultivation/ development of different types of horticulture crops and floriculture

1. The Horti hubs have been established with an objective to support the spokes around them. This is achieved by the Hubs acting as knowledge and demonstration centers. Also, the Hubs themselves are centers of excellence where top class infrastructure and assets have been created.
2. Around the Hubs, many have taken to floriculture activities after undergoing hands on training and being educated about floriculture at the Hubs. These entrepreneurs are further supported by infrastructure/ subsidy to further encourage them to start their own nursery for growing seedlings and cut flowers which will in turn help them to generate more income.
3. Vegetable production has also gone up due to the support in terms of infrastructure and support. Production of Cherry Tomato and Colored Capsicum has increased over the years due to the fact that these fetch the farmers a good price.
4. Strawberry production has also gone up after infrastructure and inputs were distributed to interested farmers.
5. Also traditional crops like Chow Chow, Khasi Mandarin, Temperate Fruits are supported and the production of these has also gone up.

3.20: Details of projects under RKVY (Horticulture)

Table 3.8: Projects under RKVY (Horticulture)

Year	Projects	Units (in nos.)	Amount (in lakhs)
2007-08	Area expansion – colored capsicum	18	100.00
	Area expansion – roses	13	98.00
	Turmeric processing unit	2	13.00
	Reefer vans	6 (MT)	60.00
	Cool rooms and Pre-coolers	6 (MT)	24.00
	Organic certificate	5 crops	45.00
2009-10	Strengthening horti hubs	7	350.00
	Post harvest management and subsidy to SHG	50% subsidy	70.00
2010-11	Development of hub and spoke model of horticulture (carnation, Gerbera, Anthurium, Orchids, Strawberry, High tunnel by the spokes, Low cost cultivation of vegetables in spoke)	7 sub schemes	1000.00
2011-12	Strengthening of horti hubs	10	1113.65
	Strawberry –concept	-	111.92
	Temperate fruit nursery	1	171.15
	Mushroom development	-	111.60
	Establishment of MSHB	1	10000.00

The above table clearly indicates a lot of variation in the projects undertaken under Horticulture. The horticulture department has adopted a modernized and attractive approach. The projects so far has created lot of interest amongst the beneficiaries particularly the housewives and young farmers. Out of these above mentioned projects under this scheme in the Meghalaya the sub schemes under the project titled “Development of hub and spoke model of Horticulture” has helped a lot in flourishing the Horti Culture amongst the people of the region, It helped in achievement of sustainable amount of income. As informed by the beneficiaries all the schemes that the department or the Government implements for the farmers motivate them to work hard in the fields.

3.21: Details on subsidy support given under different scheme under Horticulture

As it is seen from the above table, under RKVY, three horti hubs were established in West Khasi Hills and two in Janitia Hills and in the rest of the districts, one horti hub was established. Under RKVY the details on subsidy given to the farmers under horticulture schemes are as under:

a) Fertilizer distribution – Provides subsidy rate @ 7% for urea, 8% for DAP, and 2.4% MOP
b) Organic manure (vermicompost and compost pit) – Free establishment of vermicompost units and supply of bio-fertilizers at 50% subsidy.
c) Plant protection – supply of pesticides and sprayers to farmers for sale at 50% subsidy.
d) Plantation development – 33% subsidy on purchase of planting materials, 50% subsidy for construction of storage tank.
e) Mushroom development – supply of spawns at 50% subsidy and compost at 30% subsidy
f) Vegetable development – supply of seeds/seedlings at 33% subsidy
g) Fruit development – Financial assistance of Rs. 15000/- per farmer/ha. 1st year, Rs. 10000/- per famer/ha. 2nd year, Rs. 9000/- per farmer/ha. 3rd year, Rs. 8500/- per farmer/ha. 4th year and Rs. 8000/- per farmer/ha. 5th year.
h) Floriculture development – Providing good quality flower planting material @ 50% subsidy and low cost poly house free of cost.

The major infrastructure support provided is for Development and upgradation of horti hubs in all the districts through fencing, installation of pump set, Diesel generator, Water harvesting tanks, guest houses, grading hall etc., Green house, low cost poly house, carnation spoke etc.

3.22: Details of seeds provided to growers/quantity of seeds supplied

During the evaluation study of this project, we received enthusiastic response from the beneficiaries that out of the target beneficiaries approx. 65 % of beneficiaries of these projects are satisfied with these schemes. With the implementation of the scheme farmers who are genuine vegetable growers and suppliers were formed into groups and different type of vegetable seeds were distributed to them free of cost. The details of seed provided to the farmers under RKVY are as under:

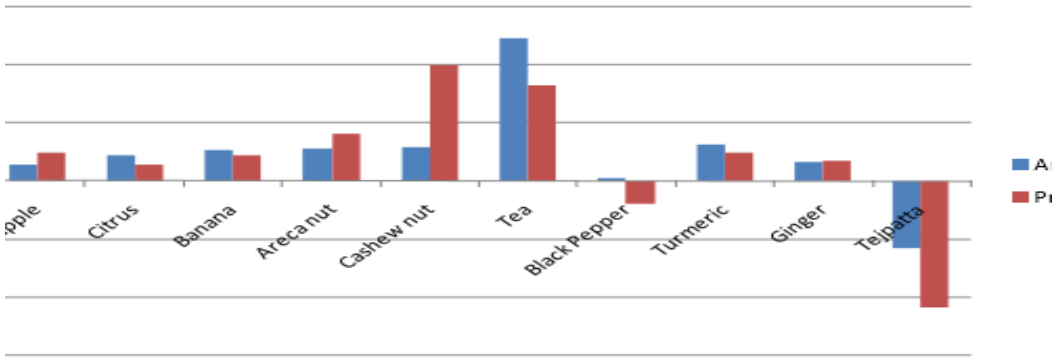
Table 3.9: Details of seeds provided to growers/quantity of seeds supplied

Type of seeds	Total quantities of seeds supplied (approx. per district)	Amount of subsidy (per beneficiary)	Production (individual beneficiary)
Carnation	38500 (in nos.)	Nil	NA
Capsicum	800 (in gm.)	Rs. 2000	600 kgs/100 sq.mtr
Tomato	400 (in gm.)	Rs. 2000	500 kgs/100 sq.mtr
Coriander	40 (in kg.)	Rs. 2000	45 kgs/100 sq.mtr

With the help of these seeds under this scheme, farmers have benefitted massively they not only performed well but also fetched good price in the market. During field visit, the team indentified that the overall condition of the horticulture crops have improved under RKVY. It was noted that tomato cultivation of East Khasi Hills district has set positive example under RKVY. It has also been discovered from the study that carrot cultivation and radish cultivation in Mylliem block of East Khasi Hills district of Meghalaya has set an successful example under RKVY.

3.23: Production of Horticultural Crops

Here is a graph showing the annual growth rate of area and production for various crops since the implementation of RKVY scheme under Horticulture Department. Noteworthy is the growth in production of Cashew – which has gone up by 12%, though the area has gone up by around 3%.

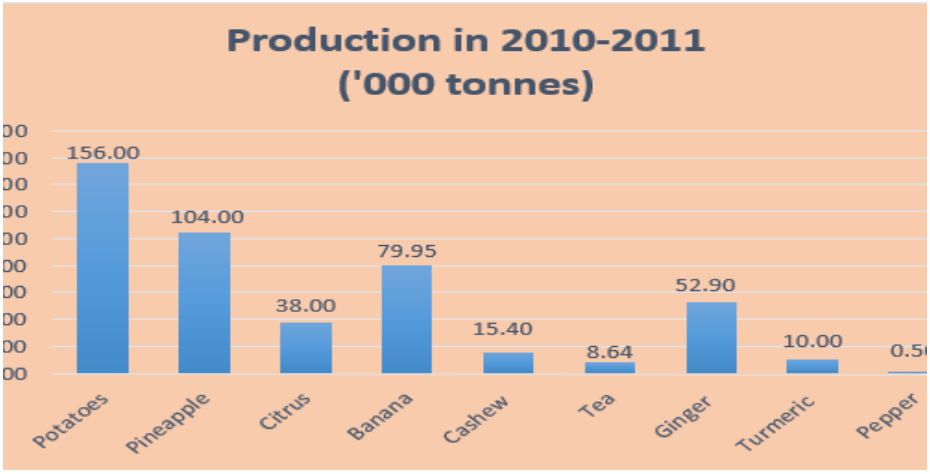


Average Annual Growth Rates of Area and Production

The report lists a series of efforts by the Directorate of Horticulture to help farmers:

- Popularizing the use of greenhouse technology, poly-houses, drip and micro irrigation system, water harvesting structures and soil-less culture.
- Dissemination of Technologies for Post-harvest management, value addition, processing and marketing is being carried out across the state.
- Plans are there to set up Cold Chains and Refer Vans based supply system to create better market access for the produce.
- Horti Hubs are also being set up in each district of the State. These will function on a hub and spoke model within an area of 10-15 Kms radius. These Horti Hubs will help in creating homogeneous horticulture clusters and provide the requisite handholding for the farmers.

The plan is to have one horticultural hub in each district to supply quality planting material and extension of marketing services and support horticulture in Meghalaya. The report also gives details of the area and production of a few of the horticultural produce of Meghalaya.



3.24: Creation of marketing facilities under RKVY (Horticulture)

The effective functioning of farmers markets depends to a large extent on the flow and easy availability of market related information to enable farmers to take proper and profitable market decisions based on reliable real time data. Market information system is thus a crucial and urgent intervention that would be made in order to make Farmers Markets viable and vibrant entities leading to the evolution of a much more transparent marketing system.

The horticulture department in the state has created marketing facilities for the growers of flowers and exotic vegetables through construction of horti hubs in each district. The ultimate aim of this initiative of the government under RKVY in Meghalaya was taking horticulture to a bigger scale and boost state's rural economy. The primary objective of the horticulture hub is to serve as a demonstration center for the farmers and people at large of the state. The horticulture hub also functions as the training centre for the farmers on new technology of cultivation, preservation and management of the crops. These horti hubs consist of collection centers operated by private service providers, where the grower can sell their produced goods and in return they get a reasonable amount of profit. This kind of marketing initiative by the horticulture department has helped many of the beneficiaries to earn up to Rs. 1,00,000 per annum.

Marketing facilities created for the growers for marketing of crops and flowers

1. Collection centers at strategic points easily accessible for collection of a single produce. These also act as grading and sorting centers before the produce is marketed.
2. Grading halls cum pack houses
3. Evacuation facilities
4. Post Harvest Management and 50% subsidy to deserving SHGs (collection centers, cold storage, evacuation facilities)

Annual Income generation by sampled beneficiaries: About 72.5 percent hub-farmers are moderate earner of income ranging from Rs.33,751/- to Rs.1,44,000/- per annum. Low income group is hardly 20 percent. The successes of any type of schemes depends on creation of a platform of marketing for sale. In every district in the state the department is having collection centres and required facility for storage of items.

3.25: Details of Horti-Hubs under RKVY (Horticulture)

Horticulture in Meghalaya is characterized by a wide range of tropical, subtropical, and temperate fruits such as citrus, pineapple, banana, strawberry, pear and plum. Rich natural resources and diverse climatic conditions also offer a huge scope for growing vegetables, flowers, spices, plantation crops, medicinal and aromatic plants. Horticulture sector thus has a promising scope for the people of Meghalaya. It augments income and enhances their Livelihoods. Excellent marketing of Anthurium under Technology Mission for Integrated Development of Horticulture has given a phenomenal boost to the farmers for cultivation of commercial crops (Syiem and Shabong, 2011). According to Eastern Panaroma (2008), one of the crops grown in horticulture hubs in Meghalaya is coloured capsicum. Realizing the potential of horticulture and considering the varied range of agro-climatic conditions and topography of the state, the Government of Meghalaya had a vision of taking of horticulture on a bigger scale. To this end, one of the best practices was the setting up of horticulture hubs in the state.

The role of the Centers of Excellence established for Strawberries, Roses and Anthurium and the success demonstrated by the farming clusters associated with these centers in the state have catalyzed the evolution of Horticulture Hubs. The “Horti-Hubs” set up in different districts of the state function on a “hub and spoke” model within an area of 10-15 kms radius. These hubs are also credited with creating horticulture clusters comprising of Individual Farmers, Self-Help Groups and Cooperatives. These clusters are given training to procure various assistance of the Government. The horti-hubs are mainly sponsored by the Government, the Service Providers, and the Farmers in a ratio of 67:23:10 respectively. Government provides one time investment for establishment of Green House including planting materials, installation of micro-irrigation systems, fertilizers and plant protection chemicals. Service providers make investment in rendering extension services, transfer of technology, grading, packing and marketing. Farmers make investment in land, labour, manures, water and power for running the production units.



The criteria for crop selection in the hub are mainly dependent on agro-climatic suitability in a particular area, trained expertise in floricultural crops, and scale of economics for the cluster unit. These hubs are mainly responsible for the development of spokes through formation of crop technology clusters, provisions of technical and other inputs, undertaking the process of monitoring, assigning area expansion activities, developing localized centre of excellence, acting as a training centre to farmers on new crop technology, and cultivation, commercialization and management of crops. Presently, there are seven horti-hubs in different districts of Meghalaya. Depending on the suitability of climate and market demand, horti hubs are specialized in different horticulture crops. The horti-hubs located in different districts of Meghalaya with their unique specialties are shown in the below table.

Table 3.10: District wise details of Horti – Hub

District	Specialization
East Khasi Hills	➢ Functions as a Hub for temperate zones ➢ Catering to flower cluster ➢ Specialised for Flowers, Orchids like Cymbidiums, Lady Slippper ➢ Carnations, Liliums , Alstromeria
West Khasi Hills	➢ Rose, Carnations
Jaintia Hills	➢ Rose, Gerberas, Carnation, Leather Leaf Fern, Orchids
East Garo Hills	➢ Bird of Paradise, leather Leaf Fern, Orchids
West Garo Hills	➢ Anthurium Carnation, Heliconia, Leather Leaf Fern, Strawberry, Coloured Capsicum
South Garo Hills	➢ Anthurium, Coloured Capsicum, Leather Leaf & Vegetables
Ri-Bhoi District	➢ Rose and Strawberry

Table 3.11: District/ location wise details of Horti – Hub and incurred expenditure

Sl.no.	District	Horti hub (in nos.)	Location	Amount (in lakhs)
1	East Khasi Hills	01	Upper Shillong	190.55
2	West Khasi Hills	03	Nongstoin, Mairang, Phodkylla	222.76
3	Jaintia Hills	02	Thadlaskein, Mynkre	143.86
4	South Garo Hills	01	Mineng	103.48
5	East Garo Hills	01	Sarangma	146.20
6	West Garo Hills	01	Zikzak	144.00
7	Ri Bhoi	01	Kyrdemkulai	40.46

3.26 Profile of Sampled Beneficiaries

Age : Majority of the farmers belonged to middle aged category and 52.5 percent of them were engaged in horticulture hubs followed by old aged farmers constituting 35 percent. The average age of the farmers participating in horti-hubs was 47 years. This implies that majority of the farmers are middle aged farmers who are having regular access to horti-hubs.

Gender : About 52.5 percent of farmers are female beneficiaries and 47.5 percent male counterpart. The reason for having more number of female farmers in horticulture is mainly because they have deeper interest in horticultural farming as compared to men. Equal access to services and deliveries provided by the government-irrespective of sex are also attributed to this phenomenon.

Educational qualification : Majority 87.5 per cent of farmers are secondary education. There were no farmers with zero illiteracy since only farmers with middle school education and above were permitted to engage themselves as beneficiaries of the scheme under horticulture hub. Further, the beneficiaries of horti-hubs were participated in a basic training on floriculture cultivation.

Farm size : All the farmers associated with horti-hubs are marginal. The average size of land holding of these farmers is 0.5 ha. No farmer was found to have a land of more than 1 hectare since the area required by the hub to start floriculture was 200 sq. meters and a maximum of 500 sq. meters.

3.27 Feedback, Social impact Success Story of RKVY Scheme under Horticulture Department

1. ORGANIC FARMING UNDER RKVY SCHEME FOR VEGETABLES IN EAST KHASI HILLS DISTRICT PROGRESS AND ACHIEVEMENTS

The marketing board Shillong was entrusted with the organic certification of vegetables in East Khasi Hills district under RKVY scheme 2007-08. For this a total amount of 13.00lakh was earmarked for implementation work, out of which an amount of Rs. 9,25,043/-(rupees nine lakh twenty five thousand forty three)only has been incurred till date. Umtyrniut Mawmyrsiang village under Mawphlang block was identified and till now 25 farmers have been registered for an area of 5.00 hectares under this programme.

Crop undertaken is cauliflower which is followed by garden pea as rotation crop. Pea is planted in order to maintain the fertility of the soil. SGS, Kolkata is identified as certifying agency for organic certification of the crop. The crop undertaken under the programme has already been certified by the certifying agency and the certification is to be renewed after every year.

Regular trainings and discussions are organised on nutrient management, crop protection and other farming operation as and whenever the need arises. The inputs such as seeds, cowdung etc., are being provided by the board to the farmers free of cost under the scheme.

Designated officials of the SGS (certifying agency) had in the beginning visited the organic farm site and briefed both departmental as well as registered growers on the importance to adhering to the guidelines while implementing this programme.

PRODUCTION DETAILS

YEAR	AREA	QUANTITY HARVESTED IN KGS
2010-11	2.00 Ha	13824
2011-12	0.625Ha	3336
2012-13	1Ha	10224

2. Success Story: Mrs. Shamoris Lyngdoh Mawlong

Name : Mrs. Shamoris Lyngdoh Mawlong

Age : 58 Yrs

Location : 1200 sq. m

Impact : Increase in income and employment

Smt. S. Lyngdoh, an enthusiast floriculture grower, is making a good harvest. Through a Public Private Partnership mode with the State Department and Zopar Exports and North Bengal Floritech, Smt. S. Lyngdoh cultivated roses in an area of 200 square meters with a turnover of Rs.36,000 annually. Presently, she is able to expand her area to about 1200 square meter through her own resources. Being a hard worker and a dedicated farmer, besides cultivating roses, she has Expanded her cultivation to Gerbera, Anthurium, Carnation and Astomeris, earning an income of Rs.1,00,000 annually. Further, this has also provided employment to other members of the village helping them to earn their livelihood. Seeing her success, she has become an inspiration to other farmers in the village.

3. CARROT CULTIVATION UNDER THE SCHEME RKVY-NVIUC IN MYLLIEM BLOCK

The National Vegetable Initiative Urban Cluster under RKVY Scheme paved the way as a blessing to the farmers who got the opportunity to become members of Kissan Sammrudhi Group. With the implementation of this Scheme, the farmers who are genuine vegetable growers and suppliers were formed into groups and different types of vegetable seeds (based on climatic condition) were distributed to them free of cost through the office of the District Horticulture Officer, Shillong.

Carrot is one of the vegetables which are being included for the implementation of the Scheme and seeds of varieties Kuroda (US Agri) and New Kuroda Improved were distributed to 15 cluster groups which consisted around 150 No. of farmers, mostly in Shilliangum area, which covered an area of around 20 Ha. Inputs like P.P Chemicals, Equipments, and Multiplex were also distributed to the

farmers free of cost and the beneficiaries had to contribute labour charges, farm yard manures and chemical fertilisers. The implementation of the Scheme is effective and successful as the crop not only performed well but also fetched good price in the market and brought profits to the farmers.

The expenditure incurred for cultivation of this crop and the Net profit is being worked out approximately as follows:

Total cost of cultivation for 1 Ha	-	2, 20,000/-
Average Yield/ Ha	-	20 MT
Average market price	-	30/- per Kg
Total income for 1 Ha	-	6, 00,000/-
Net profit	-	3, 80,000/-

4. RADISH CULTIVATION (OPEN POLINATED) UNDER THE SCHEME RKVY-NVIUC IN MYLLIEM BLOCK

Mylliem Block with a favourable climatic condition has a great potential for Radish cultivation (open pollinated) of local variety both for table consumption and for seed production where farmers raise the seed to meet their own requirements and also for selling to other farmers of other areas. The launching of NVIUC under RKVY Scheme in 2011-12 has strengthened the farming community. M/S K.Pathaw Private Nursery a successful nursery (aided under TMH) at Laitjem, got the opportunity to supply Radish seed to the office of District Horticulture Officer, Shillong and the same was distributed in cluster mode to different Kisan Samruddhi Groups under the district for area expansion. The performance of the crop is good and the farmers are being benefited which ultimately brings to the success of the implementation of the scheme.

Under the scheme NVIUC 2011-12 inputs like seed, multiplex, plant protection measures were distributed free of cost through the office of District Horticulture Officer, Shillong to a number of

groups at Rngi Shillong, Mawklot, Umlyngka, etc. Simple and easy cultural practices of only one time earthling up is being carried out in this crop, with almost zero percent of Farm Yard Manure and fertiliser application as the crop is being sown as the second crop after potato or beans. The farmer had to contribute only labour charge and contingency expenditure right from the time of sowing to the time of marketing.

The following is the consolidated cost of cultivation and Net profit being worked out approximately:-

Total cost of cultivation for 1 Ha	-	60,000/- (with contingency expenditure)
Average yield /ha	-	20 MT
Market price	-	10 /Kg
Total income	-	2,00,000/-
Net profit	-	1,40,000/-

The success of the Group and the successful impact of the scheme have worked as a motivation to the attention of other farmers who also wish to avail the assistance from the Department.

5. CAULIFLOWER CULTIVATION AT MAWKRIAH VILLAGEWith the launching of NVIUC/RKVY 2011-12,

Thirty three (33) groups have been selected under Vegetable Cluster, where three groups have been identified at Mawkriah (East) Village viz.

1. Lasynroplang KSG, Mawkriah East (10 members)
2. Behsha Kathong KSG, Mawkriah East (11 members)
3. Nangpynroi KSG, Mawkriah East (11 members)

Each member of the group grows cauliflower extensively ranging from 5,000-25,000 seedlings. Mawkriah offers an excellent scope for growing different types of horticulture crops including fruits

and flowers, both indigenous and exotic. The higher altitude provides a conducive Ecosystem to grow the traditional crops like Potato and Cole-crops during rainy season. The total area covered under cauliflower cultivation is approximately 20 hac. The above mentioned groups are very hard working and are being supported with necessary inputs and the technical guidance from the office of the District Horticulture Officer, East Khasi Hills, Shillong.

The cost of cultivation and the yield report as per the information worked out is as follows: -

A. Inputs = (450gm seeds = 45,000 no's of seedlings) hac (approx)

i.	Cost of seeds 450gm	=	Rs. 5,500/-
ii.	Cost of farm yard manure 6MT	=	Rs. 65,000/-
iii.	Cost of fertilizer 1 MT(approx)	=	Rs. 15,000/-
iv.	Cost of P.P Chemicals (LS)	=	Rs. 4,500/-
	Total	**=**	**Rs. 90,000/-**

B. Operation & Labour Cost: -

1.	Land Preparation (20MD * 12 days * 150)	=	Rs. 36,000/-
2.	Laying Out and Pit digging @ Rs. 50/100 No's	=	Rs. 22,500/-
3.	Application of Manures, P.P.C & Planting @ Rs. 50/100 No's	=	Rs. 22,500/-
4.	Cost of weeding, spraying top dressing etc (5MD *45days *150)	=	Rs. 33,750/-
5.	Harvesting, dressing, packing @ Re. 1/No.	=	Rs. 35,000/-
6.	Transportation @ Re. 1Kg	=	Rs. 35,000/-
7.	Misc etc.	=	Rs. 15,250/-
	Total	=	Rs. 2, 00,000/-
	Total (A+B)	**=**	**Rs. 2, 90,000/-**

Yield

The average yield/hac	=	35MT
The average sale of Cauliflower = Rs. 6, 65,000/- per hec	=	Rs. 18,000 – 20,000/MT (approx)
Net Profit	**=**	**Rs. 3, 75,000/- per hec**

Cauliflower cultivation at Mawkriah Village is a very successful one, as the farmers do not face any difficulties in marketing this crop. Successful implementation of this scheme serves the Village as a model for the neighbouring Villages and as a result more farmers have come forward to avail the assistance from the Department.

6. IMPLEMENTATION OF NATIONAL VEGETABLE INITIATIVE SCHEME FOR URBAN CLUSTER UNDER RKVY 2011-12 AT MAWPHLANG EVELOPMENT BLOCK

The National Vegetable Initiative Scheme for Urban Cluster (NVIUC) was introduced in East Khasi Hills district in 3(three) community and rural development block of Mylliem, Mawryngkneng and Mawphlang. The main objective of the scheme is to promote farmers in organizing themselves in a group with a common holistic approach to strengthen their capacity through best agriculture activities at various levels right from input of better technology, increased level in productivity, access to high quality inputs, better marketing opportunities etc. It is expected that with implementation of this scheme, all these core issues will help the farming community to strengthen their livelihood through sustainable agriculture.

Under the specific guidelines, the office of the Horticulture Development Officer, Mawphlang kick start the implementation of the scheme after organizing several meetings with farmers of identified areas in and around Mawphlang to share about the concept of the scheme. In collaboration with Field Executives from Indian Grameen Services, the first and foremost task of baseline survey was completed in April 2012. Altogether, 22(Twenty Two) Nos of Farmer Interest Groups (FIGs) was formed involving 250 (Two Hundred Fifty) Nos of farmers. These 22 FIGs spreads over 13 villages under cluster approach. With the successful formation of FIGs, the rest of the programme implementation got underway with each group started operating their bank account in nationalised and state cooperative banks located in Mawngap and Shillong.

Through this scheme, various input support were distributed to these groups which include Hybrid Vegetable Seeds, Open Pollinated Vegetable seeds, Plant protection chemicals and equipment, fertilizer etc. The vegetable seeds comprised mainly of Cauliflower, Pea (both hybrid and open pollinated), Cabbage, Capsicum, French Bean, Tomato, Chilli. During the process of implementation,

the implementing agency conducted several visits to these identified villages and assessed the overall condition of the crops during different stages. The FIGs received on the spot training programmes with concrete advisory tips to improve productivity. The overall performance of this scheme was very satisfactory in which the supervising officer lauded the effort of the co-operation of these FIGs which ultimately brought commendable results vis a vis better net returns.

To sum up the report, the undersigned have observed that all these 250 nos of farmers were benefitted from the scheme and the entire group performed within the expectation of the implementing agency. However, amongst all , 4(Four) FIGs viz Iatyllilaang FIG of Mawreng Village, Umpohliew FIG of Mawngaprim Villaage, Maitnaphang FIG of Marbisu Village and Erpynggad FIG of Kharnongwah Village have extremely performed very well and produced phenomenal results

T. Jyrwa Member of Iatyllilang FIG attending his cauliflower plants

Luxiriant growth of cauliflower in Mawreng village

7. PEA (CHERRAPUNJEE) CULTIVATION (OPEN POLLINATED) UNDER THE SCHEME NATIONAL VEGETABLE INITIATIVE FOR URBAN CLUSTER UNDER NONGKREM CIRCLE

Pea is an important vegetable crop which requires cool and dry climate as longer cold spell increases its yield. As a cool season crop, it is extensively grown in temperate zone.

The introduction of NVIUC Scheme under RKVY 2011 – 12 has greatly benefitted the vegetable growers of Kisan Samruddhi Group since the office of the District Horticulture Officer, East Khasi Hills, Shillong has supplied them with different types of vegetables seeds (both hybrid and open pollinated), among which pea (Cherrapunjee) seeds is one of them. Other inputs like plant protection chemicals & equipments, multiplex were also distributed. The farmer had to spend only for FYM, Chemicals fertilisers and labour charge for land preparation, sowing, intercultural operations, harvesting, packing, transporting etc. Technical guidance and support was given to the farmers from time to time.

The following are the cost of cultivation in brief and cost benefit ratio:-

Total cost of cultivation for 1 Ha	=	1, 50,000
Average yield / ha	=	8 MT
Average market price	=	60/kg
Total income	=	4, 80,000
Net income	=	3, 30,000
Cost benefit ratio	=	1:3.2

The ability of the members of Kisan Samruddhi Group to adopt the latest technologies involved under pea cultivation along with the assistance gained from the Department has enabled them to improve their economic condition which in turn helped them to increase their acreage for hybrid

and open pollinated vegetables. More farmers have approached the Department for assistance and technical advice and wanted to be a member of Kisan Samruddhi Group. This is one of the achievements of the successful implementation of NVIUC Scheme under RKVY.

8. CABBAGE CULTIVATION (HYBRID) UNDER NATIONAL VEGETABLE INITIATIVE FOR URBAN CLUSTER SCHEME, RKVY 2011 – 12 UNDER NONGKREM CIRCLE

With the implementation of National Vegetable Initiative for Urban Cluster Scheme under RKVY 2011 – 2012 from the office of the District Horticulture Officer, East Khasi Hills, Shillong, thirteen (13) Kisan Samruddhi Groups were formed under Nongkrem cluster comprising of 165 farmers. Based on the agro – climatic condition prevailing in the area, different types of vegetable seeds (both hybrid and open pollinated) were distributed free of cost to the members. Apart from vegetable seeds, inputs like plant protection chemicals & equipments and multiplexes were also distributed. The farmer had to spend only for farm yard manure, chemicals fertilisers and labour charge for land preparation, sowing, transplanting of seedlings, intercultural operations, harvesting, packing, transporting etc. Among hybrids, cabbage cultivation is very popular at Nongkrem and its surrounding areas in East Khasi Hills District since the area is quite suitable for this crop which brings economically higher returns for their livelihood.

In lowland areas, the time of sowing starts from 2nd week of January whereas in upland the best sowing time is from the month of March and continues till the month of June for continuous production and supply in the market. The crop performance is good; resulting to higher yield since the farmers welcome every suggestions and ideas imparted by the technical officers of the department.

The cost of cultivation and cost benefit ratio being w orked out approximately as follows:-

Total cost of cultivation for 1 Ha	=	1, 00,000 (Approx.)
Average yield / ha	=	25 MT.
Average market price	=	12.00
Total income	=	3, 00,000
Net income	=	2, 00,000
Net benefit ratio	=	1:3

Through this scheme the members of Kisan Samruddhi Group have been able to increase the acreage under vegetable cultivation for sustainable production. This success has drawn the attention of other farmers and many of them wants to be a member of Kisan Samruddhi Group.

9. Success Stories under Mawryngkneng Block Cluster

1. TOMATO CULTIVATION

The Synroplang KSG consists of 13 members all from Pdengshnong locality under Mawryngkneng village. They cultivate tomato in one plot of land measuring 1 hectare in area under the NVIUC Scheme. Through this scheme they acquire 2 packets each of tomato hybrid (TO-0170), multiplexes and insecticides, and cultivate it in the plot of land (divided among themselves) which they hire from the local people. Cultural practices such as weeding, spraying of insecticides and harvesting are done on their own with their own expenses.

Through their hard work, they were able to get a good harvest as well as good returns. Harvesting was done in different harvesting stages i.e in 4-5 stages.

By Calculation:-

1 farmer	=	2 pkts
2 pkts	=	3000 plants @ 1500 plants / pkt.
3000 plants X 2Kg/plant	=	6000 Kgs.
6000 Kgs X Rs. 20/Kg	=	1,20,000.00

Gross income	=	Rs. 1,20,000.00
Deducting misc. expenditure	–	Rs. 20,000.00
Net income	=	**Rs. 1,00,000.00 (Rupees One lakh) only.**

Thus, as the proverb says 'as you sow, so shall you reap'. The same with SYNROPLANG KSG, because of their hard work, dedication, unity, they were able to uplift their living standard in supporting and bringing up their kids in a proper manner.

2. LAMJINGSHAI KSG, PURIANG.KNOL-KHOL CULTIVATION:-

Smt. Rosina Mynsong is one of the 11 members of Lamjingshai KSG, Puriang. She plants Knol-khol, cabbage and tomato in her plot of land. She acquired these seeds from the NVIUC Scheme cum RKVY, implemented by the Office of District Horticulture Officer through Horticulture Development Officer, Mawryngkneng. Smt. Rosina Mynsong is a hardworking farmer who along with her family spends most of her time in farming. Thus, in return she gets a good harvest of all her produce.

For example;

Knol-khol :	1 tin @ 250 gms	=	500 Kgs
	500 Kgs X Rs. 30/Kg	=	Rs. 15000.00

Gross Income = Rs. 15000.00
Deducting misc. expenditure of Rs. 3000.00
Net Income = Rs. 12,000.00 (Rupees Twelve thousand) only.

Cabbage :- 2 Pkts @ 1000 plants / pkt.
2000 plants X 1.5 Kg/plant = 3000 Kgs
3000 Kgs X Rs. 8/Kg = Rs. 24,000.00

Gross Income = **Rs. 24,000.00**
Deducting misc. expenditure = Rs.5000.00
Total Net Profit = **Rs. 19,000.00 (Rupees Nineteen thousand) only.**

Farmers Point of View:

Through the help of the said Scheme, I am able to support my family as well as expand my farming. Thanks a lot.

10. Tea Development Centre, Umsning

The Tea Development Centre, Umsning was inaugurated in the year 2010 which was one of the pilot projects and also the first organic tea project in Meghalaya initiated by the Directorate of Horticulture, Government of Meghalaya. Since then the Development centre has made a steady progress in Ri Bhoi and its adjoining districts as well. The certification of being organic according to the National Programme of Organic Standards (NPOP) and the certifying agency being the Control Union Certifications (India) has helped the development centre not only in the domestic market but in the international market as well.


The development centre has emphasised more on the quality production of the organic tea rather than focusing only on quantity and fetching a high price in the market. The area of tea plantation in the Tea Development Centre is 4 hectare with 34 workers working in the field and 6 solely in the factory for manufacturing, processing and packaging of the tea. The capacity of the factory is 5 tones.

The Tea Development Centre also assists the Ri Bhoi Tea Growers Association in processing their raw materials in the factory of the centre. The Ri bhoi Tea Growers Association has a strength of 106 active members with its objective of working for the welfare of the tea grower members in the district.

The horticulture department organised an exposure trip to Bangalore for the farmers to inform them about the production of organic tea and other essential information for the same. A group of farmers also participated in an International Trade fair held at Pragati Maidan in the National capital where they displayed varieties of the organic tea produced in the state of Meghalaya.

The Ri Bhoi Tea Growers Association has approached the government for setting of a new factory through a gap funding project for the tea farmers of the district which will help them in attaining an increase in overall production as well as help them in fulfilling their economic needs. The Ri Bhoi Tea Growers Association has decided the name of the new factory as ARSLA Organic Tea Growers and Producers Cooperative Society Limited. ARSLA is a local term where AR means two and SLA means leaves, combining the two it is “Two Leaves”. Till date, approximately 29 farmers have joined the association. It is assumed that the setting up of the new factory by the association will be a great boost for the overall production of the Organic Tea in the district and also in the state.

3.28 Social acceptability of the scheme

Around 90 percent hub-farmers thus experience a substantial increase in their annual income. In addition, 87 percent hub-farmers say that Horti-Hubs have also generated additional employment for their family. As regards increase in production and productivity, 47 percent hub-farmers feel that their production remarkably increased mainly because they got the benefits of : ”Area Expansion” granted by Hortis Hubs for growing more horticultural crops.

3.29 SWOT Analysis of the Scheme

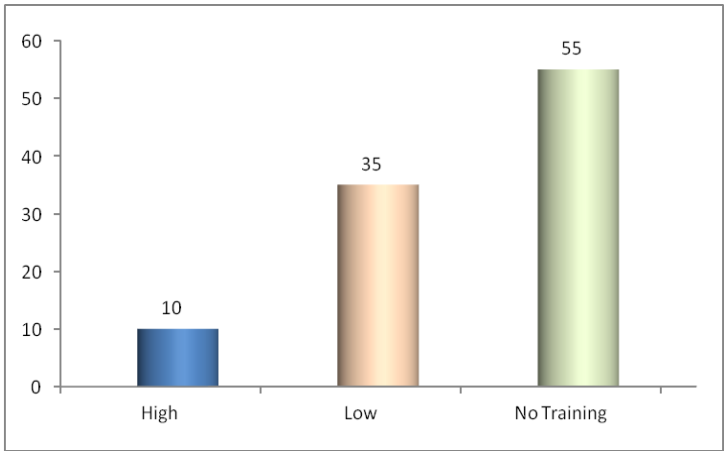
Positive achievements:

The "RKVY Scheme" under Horticulture Department has significantly contributed to improving the socio-economic conditions of the farmers with regard to their level of income, employment opportunities to become entrepreneurs, increase in production as well as better linkage with national markets enabling them to market their produce efficiently. Group and individual interaction with the farmers. Horticulture Mission helped them to overcome the constraints faced by them such as untimely supply of inputs by service providers and more training on proper management of horticulture farms/hubs.

During the evaluation study, it has been discovered that Significant expansion of area and production of low volume high value crops like strawberry, anthurium and coloured capsicum led to income and employment generation among farmers. The State is one of the top producers of strawberry. These crops have also come up in non-traditional districts like West Khasi Hills, Jaintia Hills, and South Garo Hills. New and improved technologies have been inducted in the form of micro-irrigation and protected cultivation in farmer's fields.

Weakness:

- Marketing is the major weakness of the State. The topography and poor connectivity are the major hurdles for the development of horticulture in the State. The monopoly of the private traders, weak cooperatives and lack of market intelligence are the major constraints in marketing.
- From the table below it is clear that only 10% of the respondent is highly satisfied with the training programmes conducted. However, 35% of the respondents are not fully satisfied with the training programmes conducted. While around 55% of the respondents have not participated in any training programme. Base on the field visits and available data it is suggested to undertake more capacity building programmes and also encourage the trained farmers to be the facilitators to spread appropriate technologies to the neighboring farmers.



- Inadequate supply of quality planting material is a major problem. Today, the planting material for most of the high value crops is being imported.
- Inadequate infrastructure for marketing, handling, and processing of agricultural produce.
- Poor infrastructure, road inaccessibility, lack of collection centres, godowns, pre-cooling/ cold rooms.
- Inadequate facilities for post harvest management-grading, washing, packing rooms at village and cluster village.
- Irregular power supply in the district.
- Increase in prices and non availability of plant protection chemicals and fertilizers

Opportunity:

During the evaluation study it is found that the greatest advantage of being associated with Horti-Hubs is that the farmers get an opportunity of "Assured Marketing" of their produce. All the 100 percent farmers of Horti-Hubs are expressed their full satisfaction in obtaining the remunerative price of their farm produce. This is a great benefit indeed which otherwise would have been routed through a number of intermediaries resulting in low price.

It is also found that Producers Organizations play a critical role in implementing, orienting, and assessing Advisory Services especially to Family Farms from this Postilate, they drew a point that the sustainability and scalability of MAFF-Mechanism largely depends upon the Producers Organizations. Therefore, Producers Organizations need to be well-trained and strengthened in their capacity enforcement. Two parameters are noted from this finding. One is the Family Farms and another Producers Organizations. Horti-hubs in Meghalaya, therefore should work out their strategy

first for concentrating efforts in associating the Family Farms with horti-hubs and secondly form co.operative Societies of general hub-farmers. Both these systems can certainly give a boost to horticultural crops in Meghalaya.

Threats:

- Push for GMOs and agrichemicals
- Market threats eg. Food mills
- Incoherent government policies
- Pressure from commercial forces to lower standards of organic agriculture
- International competition

3.30 Recommendations:

However, implementation of the 'Technology Mission on Integrated Horticulture' the 'hub and spoke' model platform is to boost horticultural production. Horticulture in Meghalaya is now on a growth trajectory where entrepreneurs are thriving commercial enterprises to improve their socio-economic conditions and enhance their livelihoods.

- It was found during the survey that farmers require demonstration of best practice for adopting new technologies. Presentation of new technologies and crop management practices are being taken up on the fields of progressive farmers who have got the assistance for inputs. The success stories of the farmers will be documented by audio-visual methods and shown to other farmers for their awareness and learning.
- Farmers associations (FPOs & FIGs, etc) should be promoted for development of horticulture as a holistic approach
- Convergence with other programmes should be established for optimising the resource use
- Establishment of direct marketing linkage is the need of the hour. Currently, farmers are not having any access to market information. Marketing services, including collectivisation, joint transportation system, direct reach to market/retail, institutional sale, access to market information on daily basis are some of the interventions which are required.
- The lack of proper knowledge about management of pests and insects is reported to be a serious problem for low production of flowers in the horticulture hubs. Therefore, a regular

training and skill development programmes at the field level was the need of the hour to support and encourage the farmers to increase their area and production of horticulture crops.

- Cluster approach to strengthen the existing concentration of crops. For each crop post harvest management and value chain management will be given emphasis so that additional income and employment will be generated in the State itself
- New technologies in Post-Harvest infrastructure like grading, packaging, ripening chambers will be introduced for the major crops in areas of their concentrations. As it is difficult to attract huge investment to start large scale processing units, small scale and cottage units will be encouraged and support will be provided for them
- There is also a need to provide timely supply of inputs by service providers to enable the farmers to make efficient use of resources and inputs at the right time to enhance production. Further, extension officers should carry out proper follow up of the problems faced by the farmers at the field level and provide relevant information right from production to marketing of the produce. Horticulture is at its nascent stage just a hobby by flower lovers.
- To provide necessary subsidy for erection of greenhouse in cluster mode for mass production of vegetable seeds.
- To establish virus free mother block of citrus in green house for mass multiplication of disease-free planting material.
- To prioritize canopy management and rejuvenation programme in fruit crops for enhancing quality production, productivity, profitability and sustainability.
- To create awareness amongst the farmers for latest production technologies in horticulture sector.
- To promote cultivation of export oriented varieties of ginger with low fiber content.

Animal Husbandry and Veterinary Department

The Department of Animal Husbandry and Veterinary is entrusted with the responsibility of all aspect of Livestock and Poultry Development, like, production, processing and marketing of livestock and poultry and their products through augmentation of production of milk, meat, eggs and wool. Animal health care service and prevention of animal diseases is a priority for maintenance of a healthy stock for optimum production. Creation of suitable infrastructure for breeding, feeding and management of livestock and poultry, processing of milk, meat and eggs and marketing of livestock and livestock products is also given due importance. Besides, the Department is engaged in providing the required training and extension support to livestock producers so as to promote scientific rearing of livestock and poultry amongst them with consequent generation of employment avenues in the rural areas. The details of funds allocated under different schemes implemented by AH & Vt. Dept. are as under:

3.31: Financial allocations under different scheme implemented by AH & Vt. Dept.

Table 3.12: Financial allocations under different scheme implemented by AH & Vt. Dept.

Sl no	PROJECTS	Amount Sanction (in Cr.)	Amount Released (in Cr.)
1	Establishment of 2 (two) Base Pig Breeding Farms with 100 sows + 20 boars per unit in West Garo Hills and East Khasi Hills districts	4.98	4.98
2	Establishment of 2 (two) New Veterinary Dispensaries	1.06	1.06
3	Strengthening of existing Pig Farm, Jowai from 20 to 100 sows unit	1.00	1.00
4	Community Livestock Farming each in 7 (seven) districts – Piggery Farming with 20 sows + 5 boars per unit	1.85	1.85
5	Establishment of Poultry Breeding Farm with 5000 Parent Layer Stock in East Khasi Hills district	2.59	2.59
6	Enhancing Beef Production – Strengthening of existing Cattle Breeding Farm,Kyrdemkulai with Indian Breed of cattle – 136 nos. milch cows	2.64	2.64
TOTAL		**14.12**	**14.12**

3.32 Infrastructure establishment by AH & Vt. Dept.

The different infrastructure created within the department is as follows: -

Table 3.13: Infrastructure created by AH & Vt. Dept.

Sl. No.	Infrastructure	2012-13
1	Veterinary Hospitals	04
2	Veterinary Dispensaries	92
3	Veterinary Aid Centres	51
4	Mobile Veterinary Dispensaries	15
5	Vigilance Unit	03
6	Intensive Cattle Development Project	02
7	Stockman Centres	63
8	Key Village Centre	16
9	Cattle Breeding Farm	04
10	Poultry Farm	12
11	Pig Farm	13
12	Sheep & Goat Farm	02
13	Buffalo Farm	01
14	Duck Farm	01
15	Fodder & Fodder Seed Production Farm	02
16	Fodder Demonstration Farm	03
17	Feed Mill	02
18	Rabbit Farm	01
19	Check Post	04
20	Vaccine Depot	01
21	State Disease Diagnostic Laboratory	01
22	District Disease Diagnostic Laboratory	07
23	Vocational Training Centre	02
24	Dairy Plant	03
25	Chilling Centre	03
26	Creamery & Ghee making Centre	01

3.33: Details of different projects implemented under RKVY

Table 3.14: Details of different projects implemented under RKVY

Sl. No	Projects	Location	District	Nos.
1	Veterinary Dispensary	Khonglah	Jaintia Hills	01
2	Strengthening of Pig farm	Khliehtyrshi	Jaintia Hills	01
3	Community Pig farm	Nangbah	Jaintia Hills	01
4	Community Pig farm	Thangsning	East Khasi Hills	01
5	Veterinary Dispensary	Ichamati	East Khasi Hills	01
6	Estt. Of Pig farm	Nongpiur	East Khasi Hills	01
7	Estt. Of Poultry farm	Nongpiur	East Khasi Hills	01
8	Community Pig farm	Mawkyrwat	West Khasi Hills	01
9	Cattle farm	Kyrdemkulai	Ri Bhoi	01
10	Community Pig farm	Umroi	Ri Bhoi	01
11	Estt. Of Pig farm	Gindo	West Garo Hills	01
12	Community Pig farm	Dobakki	West Garo Hills	01
13	Community Pig farm	Mendipathar	East Garo Hills	01
14	Community Pig farm	Ganol Songma	South Garo Hills	01

Under RKVY scheme, 14 different schemes have been implemented in different districts. Out of these, 50% of the schemes are based on community piggery. All the schemes implemented are showing good progress especially the Poultry farm at Nongpiur, cattle farm and the Pig farm at Khliehtyrshi. There is a major concern of shortage of man power for running the farm in a better way.

3.34: Details of farm in terms of location/production/area*

Table 3.15: Details of farm in terms of location/production/area*

Sl.no.	Scheme	Location	Production
1	Establishment of Pig Farm	Nongpiur	110 approx. (piglets)/annually
2	Strengthening Cattle Farm	Krydemkulai	55.44 approx. (litres)
3	Establishment of Poultry Farm	Nongpiur	Eggs- 14 lakhs, Chicks – 1120 lakhs
4	Strengthening Pig Farm	Khliehtyrshi	358 approx. (piglets) /annually
5	Community Pig Farm	Nangbah	75 (piglets) /annually
6	Community Pig Farm	Umroi	55 (piglets) /annually
7	Community Pig Farm	Mawkyrwat	50 (piglets) /annually
8	Establishment of Pig Farm	Gindo	180 (piglets) /annually
9	Community Pig Farm	Dobakki	65 (piglets) /annually
10	Community Pig Farm	Thangsning	65 (piglets) /annually
11	Community Pig Farm	Mendipathar	114 (piglets) /annually
12	Community Pig Farm	Ganol	45 (piglets) /annually

- *Area covered for accommodation of 20 sows and 5 boars under community Pig Farm = 487.50 Sq.Mtr
- Area covered accommodation of Poultry Sheds = 810 Sq.Mtr.

It is seen from the above table that in the Nongpiur poultry farm 14 lakhs eggs and 1120 lakhs chicks were produced under this scheme. In Krydemkulai block's cattel farm produced approx. 55.44 (litres) milk. And Out of the ten pig farm, as far as production was concerned Khliehtyrshi block was produced approx. 358 (piglets) /annually.

Facilities available at Poultry Farm:

Chick feeders, Chicks drinkers, Electrical brooders, Chick guards, Hanging feeders, Automatic vaccinator, Laying boxes, Electrical debeaker, Aluminum buckets, Plastic egg trays, Hessian cloth, Egg weighing scale, Medicines, Disinfection equipments, Filler flaps, Refergeriator, Hatcher, feeds, water etc.

Facilities available at Pig Farm: Medicines, Clean water, Pig feed, Electricity, Medicines, fencing etc.

Some of the photographs related these poultry farm, cattle farm and pig farm is cited below:

Cattle breeding farm, Kyrdemkulai

Poultry farm, Nongpiur

Pig Farm, Khliehtyrshi

3.35 Impact of the RKVY scheme under AH & Vt. Dept.

Animal Husbandry is not only a subsidiary source of livelihood in rural Meghalaya, it is a major economic activity, especially in the arid and semi-arid regions of the state. This sector plays a vital role in the rural economy of the state and has significant impact on employment generation for marginal, sub-marginal and landless farmers. The Eighteenth Livestock Census (2007) of India has placed total livestock population at 529.7 million and total of poultry birds at 648.8 million (GOI, 2009), out of which, there are 235.15 lakhs livestock (4.44%) and 133.52 lakhs poultry (2.06%)

Only about 1.2 percent of the beneficiary farmers reported deriving income from the sale of livestock products such as milk, milk products, egg and manure. Most farmers indicated that impact of interventions on income earned through these products was less than 10 per cent. At the aggregate level also, 80 per cent of the sample households reported less than 10 per cent increase in income due to these interventions. Apart from financial assistance for the above mentioned interventions, farmers were also given feed supplements like protein to overcome the nutritional deficiency in animals.

3.36 Success Story of RKVY Scheme under Water Resource Department

POULTRY FARM NONGPIUR, UPPER SHILLONG

General Introduction: Livestock including Poultry is an integral part of agriculture and contributes significantly to rural economy. While agriculture contributes about 30% of the total output of GDP, livestock including poultry constitutes about 25% of the total agricultural output. Rearing of livestock and poultry is an age-old practice in the country with no exception to the State of Meghalaya. Livestock production has a much larger contribution to manpower employment than agriculture, while eggs, milk and meat production help in stepping up crop production through the availability of cash to the livestock farmer which is utilised for purchase of seed, manure and fertilisers for agricultural operation. Establishment of dairy, poultry, goat, pig farms help solve unemployment problems and provide valuable protein, vitamin and mineral rich materials like eggs, milk and meat. Organic manure from livestock and poultry enrich the soil for higher production of crop, vegetable and flower as well as horticultural produce.

In the State of Meghalaya, due to peculiar topography, varying climatic situation and socio-economic condition, the agriculture operation constitute to only about 10% of the total land under cultivation, thereby livestock and poultry provide the alternative avocation to the farmers for a subsidiary living. Though the present output of livestock production in the State has been increasing at higher proportion to the growth of human population, the overall availability situation is not encouraging to the extent that as against the requirement of 220 gm of milk per person per day, only 75 gm is now available in the State. Similarly, availability of eggs per person per year is only 35 as against the requirement of 150. Therefore greater efforts are necessary to close the gap between demand and supply.

Keeping the above in the background, the Department of Animal husbandry & Veterinary have taken up various measures to bring about a noticeable improvement in production, processing and marketing of livestock and livestock products. One such measure is to establish more farms with quality germplasm for making availability to farmers. Till end of 2014, the department has established the following farms in different district.

Number of Government farms available in the State:

Cattle Farm	Buffalo Farm	Pig Farm	Goat Farm	Poultry Farm	Rabbit Farm	Fodder Farm
4	1	13	2	13	1	5

Nongpiur Poultry Farm: Of the above 13 Poultry Farms, **Nongpiur Poultry Farm** is the latest that added to the list. The Farm was established under RKVY fund 2009-10 at an approved estimate of **`.**259. 00 lakhs. Construction started towards the end of 2010 and completed in the year 2012. Parent stock layer bird (**BV380**) was inducted on 2nd August 2012 which includes 1560 female and 234 male birds.

Poultry Shed

The Farm is located at Nongpiur, on the way to Mattilang Park Upper Shillong. In brief, the infrastructure created for the farm out of the sanctioned amount comprises the following:

Part-I: Total Investment in Civil construction= `.229.26 , includes:

1.	Poultry Layer shed	=	3 nos
2.	Poultry Brooder shed	=	2 nos
3.	Poultry Grower shed	=	1 no
4.	Hatchery House	=	1 no
5.	Feed Go-down	=	1 no
6.	Office building	=	1 no
7.	Doctor's Qtr	=	1 no
8.	VFA Qtr	=	1 no
9.	Labour barrack	=	1 unit
10.	Pump house	=	1 no
11.	Fencing, Approach road, electricity connection, transformer, water supply etc		

Part-II: Total Investment in Procurement of inputs = `.29.74, includes:

Purchase of Hatchers, Parent stock birds, Feed, medicine, revolving fund, wages etc

Performance of the Farm:

Total Egg sold w.e.f Jan.2013 till Dec. 2014	**=**	**656246**
Day old chicks sold	**=**	**7852**
Chicks sold	**=**	**12309**

Growers sold	**=**	**202**
Parent stock sold (culled)	**=**	**1674**
Total Revenue receipt till December 2014	**=**	**`.5142949.00**
Total egg produced in the State during 2012-13	**=**	**1027.64 lakhs**
Total egg produced in the State during 2013-14	**=**	**1049.37 lakhs**
Total egg produced in the Farm at the end of 2014	**=**	**6.56 lakhs**
Therefore contribution to annual production	**=**	**0.63 %**

Laying of Eggs

Collection of eggs

Hatcher

Cleaning & Selection of Egg

Candling of Eggs

Vaccination & Medication of DOC

People queuing up for purchase of DOC

Counting of DOC

Brooder

Layers

Manpower in the Farm:

1. Till date the Government has not sanctioned any post required in the Farm.
2. The Farm is being managed by redeploying one A.H & Veterinary Officer and three Veterinary Assistant from the establishment of Rinderpest Eradication, Shillong as a stop gap arrangement. In addition, one Senior A.H & Veterinary Officer from Regional Poultry Farm, Kyrdemkulai is providing his practical experiences in addition to his duty.
3. Eight wage labourers are engaged and assigned for cleaning of the farm, feeding of birds, attending office duties, security of the farm etc.
4. For overall supervision and financial management etc, it was entrusted to the Assistant Director,i/c Rinderpest Eradication Office at Shillong as an additional duty.

Conclusion:

1. Even in the absent of sanctioned post, the Farm is running smoothly with a good turn over.
2. The mortality rate of birds in the Farm ranges between 1- 2.5 % between day old to laying stage, which is below the average rate.
3. The location of the Farm with a chilling cold weather in winter demonstrates the viability and sustainability of rearing poultry anywhere in the State.
4. Poultry Farm Nongpiur is one of the successful establishment of the Department under RKVY Scheme.

3.37 SWOT Analysis of RKVY Scheme under A.H & Veterinary Department

The following are the Strengths

- Availability of trained and specialized personnel to assist in policy making and development of schemes
- Institutional support for designing schemes and assistance in implementation (Institutions and field stations in related areas assigned to the department – breeding stations, fodder stations, Research stations, NABARD, NDDB etc)
- Animal husbandry and dairying are a growing sector where the demand for animal products is rapidly growing and the country has vast untapped potential.
- The contribution of the sector to the GDP of the agricultural sector is very high and with increased outlay could contribute significantly to the GDP of the state.
- The sector has potential to offer avenues for self employment to the underprivileged and uneducated section of rural society and thus providing scope for generating employment and adding to rural household incomes which can have the spin off effect of increasing rural nutritional levels, rural health, alleviating poverty, empowerment of women, and prevention of migration of labour from rural to urban areas in search of employment.

The following are the Weaknesses

- Animal husbandry and dairying are a State subject and as such the department has more of a supporting role than a principal role.
- The implementation of most of the schemes of the department is through the State Governments (by the State Government or through SIAs under the control of State Governments) and hence there is lack of direct control, supervision and direction.
- The Department does not have direct dealing or contact with the ultimate beneficiary and hence the development of schemes may not be fully keeping with the requirement or aspirations of the beneficiary.
- Majority of the beneficiaries of the schemes are in unorganized sector.
- Lack of adequate resources – manpower and budgetary support
- Non-availability of field level implementing agencies under direct control of the department which can co-ordinate the activities at field level thus affecting the implementation of the schemes.

- Non-availability of field level monitoring agencies under direct control of the department which can assess the impact of the schemes and suggest modifications required to meet the aspirations of the stake holders/beneficiaries. This affects the identification of shortcomings in the scheme and thereby the opportunity for continuous improvement in the schemes.
- Low priority accorded to the animal husbandry, dairying and fisheries sector in the governance agenda of the Government.

The following are the Opportunities

- Animal husbandry and dairying are a means of livelihood or supplementary employment to a vast majority of the population of this country thus offering a huge potential for constructive development of this sector in this state.
- This sector has been largely neglected both by the Central and the State Governments; hence a co-ordinated effort would make an immediate impact.
- The investment in this sector through the Plan outlays has been meager over the years and any incremental input in this sector would yield high returns in terms of increasing productivity, poverty alleviation and employment generation.
- The efforts to contain animal diseases, provide training to farmers, extend AI coverage, etc have been constrained by lack of financial resources and trained manpower. Sustained focus in these areas will give huge dividend.
- The level of technological inputs in the areas covered by the department has been minimal. Large-scale technological inputs would result in incremental output in terms of yield and productivity.

The following are the Threats

- The majority of primary producers in the state is landless/small and marginal farmers with minimum support base and is likely to give up this vocation in times of adversity in view of poor financial support mechanism available for them. This will have a serious impact on the performance of the department.
- The implementation of the schemes/programmes of the department are essentially through the State Governments and/or through State Implementing Agencies over which the Department does not have any effective administrative control and any policy change made in

the States not consistent with the requirements of this department may affect the performance of the schemes of the department.

- If the budgetary support for the animal husbandry and dairying sector is not increased substantially over the next few years the farmers will move away from this sector which will affect the production of livestock products and may make the country dependent on imports of essential items like milk.
- Low priority accorded to the sector in allocation of funds which will impede growth of the sector and impact the achievements of the schemes/programmes launched by the department.
- If the importance accorded to this sector in the policy making and in the political space at the highest level continues as at present there is a likelihood of this sector dwindling away into insignificance.

3.38 Recommendation

- Major approach and effort should be to enhance women's access to livestock assets so as to enable them to avail benefits of various livestock development programmes and policies. This may include evolving women self-help groups or women livestock producers' association for availing credit for securing livestock and inputs; insurance to manage risk, and inputs and services to improving animal productivity.
- Women may also be provided additional incentives in terms of subsidies on interest rates and insurance premium.
- Special programmes should be initiated for developing women entrepreneurship along the livestock value chain including production, processing and marketing so as to enable them to face the emerging challenges in production and marketing. Besides, women being closely associated with animal husbandry have a better understanding and knowledge of animal behavior in respect of reproduction, feeding, symptomatic changes in animal health and response to external factors. It is suggested to enhance women's skill in various aspects of animal breeding, health, feed and nutrition, management and marketing.
- To boost animal productivity and income of the beneficiaries there is a need for appropriation of technologies that reduce drudgery to beneficiaries and improve animal health and nutrition.

Improve women's access to services through appropriate training programs/ extension programmes so as to enhance their capacity in clean livestock production and livestock management to improve resilience of livestock to climate change.

- It is essential to accord utmost priority to develop appropriate livestock extension system to fully exploit its potential for agricultural growth and rural development.
- A differentiated approach of providing extension and input services would be necessary to address the various technical, advisory and financial needs of different livestock production systems and species. This would call for building up an exclusive cadre of extension workers with appropriate skills and knowledge.
- Presently the major activities of ATMA are confined to improving crop production. There is a need to strengthen ATMA with AH experts to coordinate various extension and training activities; the private AI and other workers could be effectively utilized for providing extension services.
- The Department of AH&Vt should have special "Extension Cell" with matching official machinery in the states for formulation and implementation of programs.
- Animal Husbandry Departments should have state-of-the-art infrastructure in the area of food safety, quality control assurance and research for foods of animal origin and animal feed for offering service to dairy farmers, food processors, consumers, etc. Establishment of testing and authentication by a standard facility as proposed will also enhance the export potential of food items from the region.
- There is a major concern over the adulteration and substandard quality veterinary drugs. There are no facilities available for veterinarians or even Govt. procurement agencies to check the quality standards of veterinary drugs and potency of vaccines available in the market.

Water Resource Department

The Department of Water Resources was created out of the Directorate of Irrigation, which was under the Agriculture Department, vide Govt. Notification No.CA.24/2009/25 dated the 25th Aug 2009 This Department is headed by the Chief Engineer. Earlier, the Organizational setup, prior to the creation of the additional technical posts, consists of the Chief Engineer and Additional. Chief Engineer (M&E), being assisted by an Executive Engineer, at the State level, two Superintending Engineers at the Circle level and seven Executive Engineers at the Division / District level. There are 13 Sub-Divisions under the seven Divisional offices in the State. However, during 2010, another 10 (ten) additional posts were created.

Meghalaya is basically an agrarian State with about 81% of its population depending on Agriculture and allied activities, yet the state is deficit in food grain production. One of the major inputs for increasing food grain production in the State is undoubtedly providing of assured irrigation so that the farmers can take up double/triple cropping.

The irrigation potential created through the 256 nos of Departmental schemes completed by the end of from 2007-08 to 2011-12 is about 29,213.77 hectares which is within 13.40% of the ultimate potential. Out of this, 27,300.32 Ha is under Surface water and 1913.45Ha is under Ground water. The number of completed schemes is 246 Surface Water Schemes, 9 Nos. Deep Tube Wells and a cluster of Shallow Tube Wells.

The main function of the Water Resources Deptt. is the implementation of Irrigation Projects consisting of Surface Flow and Surface Lift Irrigation schemes in all the Districts of the State. Ground Water Irrigation schemes are also implemented in areas where they are found feasible. Besides these, there are also Centrally Sponsored Schemes which are being implemented by the Department such as the Accelerated Irrigation Benefit Programme (AIBP), RIDF schemes of NABARD, Command Area Development and Water Management (CAD&WM) Programme and Rationalization of Minor Irrigation Statistics (RMIS). Besides Minor Irrigation which are the only schemes implemented by the Directorate of Irrigation, the Water Resources Department will also implement Medium Irrigation Projects and take up flood protection and flood management works for Agricultural lands. During 2009-10 there were 72 nos of On-going Minor Irrigation schemes under

AIBP at a total estimated cost of Rs 10122.876 Lakh to cover a command area of 8600.602 Ha and to benefit 4208 families. There were also 17 nos under State Plan at a total estimated cost of Rs 1030.052 Lakh to cover a command area of 1004.08 ha and to benefit 461 families.

Types of work undertaken under WHS:

Meghalaya is blessed with abundant water. It has several rain based rivers and some places in Meghalaya receive on an average of 12,000 mm (470 in) of rain a year. About 70% of the state is forested. It is essential to make use of this vital resource for the development of State. This is one of the main objectives under RKVY scheme. Details of Water Harvesting scheme in seven districts of Meghalaya are as under:

Check dams, Pipeline and distribution, D/tank, Earthen Canal, Pond, RCC Wall, Retaining wall etc. The structures built under the scheme are quite okay, while the lack of staff for supervision is a concern. So far, the thrust in these sectors is in Area expansion of Boro Paddy through irrigation support to increase the yield to 3-4 MT/Ha as against the existing 1.5-2.00 MT/Ha. There is a need for implementation of such schemes in a larger scale in the state.

3.39: Details of scheme under Water Harvesting Scheme (WHS)

Table 3.16: Details of scheme under Water Harvesting Scheme (WHS)
(From 2007-08 to 2011-12)

Sl. No	District	No. of WHS	Area Benefitted (in ha.)	No. of families covered
1	East Khasi Hills	17	76.93	102
2	West Khasi Hills	24	231.06	192
3	Ri Bhoi	12	140.69	106
4	Jaintia Hills	15	105.75	99
5	West Garo Hills	15	196.80	232
6	South Garo Hills	8	85.00	75
7	East Garo Hills	15	66.11	114
Total		**106**	**902.34**	**921**

Water Harvesting Schemes (WHS) is a very important and reasonable means of water supply for a hilly State like Meghalaya. The high variations in spatial and temporal rainfall add to the complexity of problems associated with water management faced by the State. Therefore Water Harvesting Schemes (WHS) is a vital alternative source. Under the RKVY scheme, the irrigation department has focused on water harvesting structures which can help in irrigation throughout the year maximum no. of Water Harvest schemes are implemented in West Khasi Hills and East Khasi Hills, while the least is in South Garo Hills. Around 920 families have been benefited under this scheme.

3.40: Location details of schemes under WHS under RKVY

The details of district and village wise WHS and families benefitted from this are mentioned below:

Table 3.17: Details on schemes under WHS under RKVY

Sl. No	District	Year	Name of the WHS Scheme	Location	Estimated Cost (Rs.)	Command Area (In ha.)	No. of Families Benefitted
1	East Khasi Hills	2007-08	Dholai Malai	Mawsynram	8,12,100.00	10.00	8
2	East Khasi Hills	2007-08	Pyndenborsora	Mawsynram	`2,77,700.00	10.00	6
Sub Total					**10,89,800.00**	**20.00**	**14**
1	East Khasi Hills	2010-11	Rynli	Mawphlang	6,24,400.00	8.20	3
2	East Khasi Hills	2010-11	Umjasong	Mylliem	4,25,800.00	4.00	3
3	East Khasi Hills	2010-11	Lumsohpairah	Mawkynrew	4,68,700.00	3.20	5
4	East Khasi Hills	2010-11	Mawlyngngad	Mawryngkneng	1,47,300.00	1.00	4
5	East Khasi Hills	2010-11	Mawpran	Pynursla	4,98,200.00	3.85	5
6	East Khasi Hills	2010-11	Fernando School	Mawsynram	3,62,200.00	6.00	1 (School)
7	East Khasi Hills	2010-11	Tukhon Narum	Mawkynrew	1,34,900.00	0.90	5
8	East Khasi Hills	2010-11	Pyrdiwah	Pynursla	4,37,000.00	3.86	5
9	East Khasi Hills	2010-11	Terajamra	Mawsynram	1,87,400.00	2.20	15
10	East Khasi Hills	2010-11	Mawlyngkut	Mawsynram	1,54,000.00	3.00	10
11	East Khasi Hills	2010-11	Dompangiet	Mawsynram	1,54,000.00	3.00	10
12	East Khasi Hills	2010-11	Ryngku	Mawsynram	1,81,000.00	3.00	10
13	East Khasi Hills	2010-11	Kynton	Mawkynrew	3,08,000.00	3.62	3
Sub Total					**40,82,900.00**	**45.83**	**79**
1	East Khasi Hills	2011-12	Sonatola (Dapho)	Mawsynram	5,75,000.00	6.10	6
2	East Khasi Hills	2011-12	Lurumlakhoh	Mawsynram	5,75,000.00	5.00	4

Sub Total					**11,50,000.00**	**11.10**	**10**
1	West Khasi Hills	2007-08	Lower Puksora	Ranikor	3,47,300.00	5.25	8
2	West Khasi Hills	2007-08	Athlabari	Mawshynrut	7,19,700.00	8.50	12
3	West Khasi Hills	2007-08	Umsohpieng	Mawshynrut	8,32,600.00	12.10	07
4	West Khasi Hills	2007-08	Makbikol	Ranikor	4,73,700.00	11.75	06
Sub Total					**23,73,300.00**	**37.60**	**33**
1	West Khasi Hills	2010-11	Saitsophlang	Mawthadraishan	3,27,000.00	9.80	9
2	West Khasi Hills	2010-11	Mawkohwan	Nongstoin	3,37,000.00	12.18	8
3	West Khasi Hills	2010-11	Lawsangem	Mawthadraishan	3,99,470.00	13.20	10
4	West Khasi Hills	2010-11	Nonglait	Mawthadraishan	3,57,645.00	11.48	12
5	West Khasi Hills	2010-11	Sab-Bsein	Mairang	4,65,624.00	6.00	7
6	West Khasi Hills	2010-11	Umthangrong	Mairang	4,23,759.00	4.50	10
7	West Khasi Hills	2010-11	Gulsora	Ranikor	3,50,350.00	4.51	5
8	West Khasi Hills	2010-11	Porla	Mawshynrut	2,95,200.00	18.60	12
9	West Khasi Hills	2010-11	Proin	Mawshynrut	2,35,850.00	12.00	10
10	West Khasi Hills	2010-11	Phud Umoit	Mawkyrwat	2,37,850.00	10.00	10
11	West Khasi Hills	2010-11	pombriew	Mawkyrwat	3,90,780.00	20.00	7
12	West Khasi Hills	2010-11	Mawthawdon	Nonstoin	3,00,050.00	4.00	4
13	West Khasi Hills	2010-11	Rangasora	Ranikor	3,09,790.00	5.00	5
14	West Khasi Hills	2010-11	Wahkaji	Ranikor	2,48,050.00	4.00	5
15	West Khasi Hills	2010-11	Mawthawir	Mawthadraishan	3,30,300.00	11.50	15
16	West Khasi Hills	2010-11	Tiehnongsiej	Nongstoin	3,60,000.00	3.70	6
17	West Khasi Hills	2010-11	Sohpian	Nongstoin	13,58,745.00	13.72	8
18	West Khasi Hills	2010-11	Nongwankhar	Mairang	4,87,000.00	10.00	8
19	West Khasi Hills	2010-11	Wahsiej	Mawkyrwat	2,52,000.00	4.27	5
Sub Total					**74,66,463.00**	**178.46**	**156**
1	West Khasi Hills	2011-12	Bakra Chiring	Ranikor	16,56,300.00	15.00	7
Sub Total					**16,56,300.00**	**15.00**	**7**
1	Ri Bhoi	2007-08	Amphreng	Umsning	4,00,000.00	13.80	13
2	Ri Bhoi	2007-08	Khuswa	Umling	5,38,700.00	7.80	8
Sub Total					**9,38,700.00**	**21.60**	**21**
1	Ri Bhoi	2010-11	Umjong	Umsning	36,07,850.00	67.04	32
2	Ri Bhoi	2010-11	Birkaluin	Umling	3,60,000.00	12.00	5
3	Ri Bhoi	2010-11	Umsong	Jirang	4,70,800.00	4.25	5

4	Ri Bhoi	2010-11	Umiaphati	Umling	2,91,300.00	6.00	3
5	Ri Bhoi	2010-11	Sohriewblei	Umsning	4,92,200.00	4.00	4
6	Ri Bhoi	2010-11	Nongjri	Umsning	1,99,400.00	3.00	5
7	Ri Bhoi	2010-11	Sohbhala	Umsning	3,20,100.00	3.50	5
8	Ri Bhoi	2010-11	Warmawsaw	Jirang	4,85,000.00	4.30	6
9	Ri Bhoi	2010-11	Umdaptop	Jirang	3,65,585.00	3.00	5
Sub Total					**65,92,235.00**	**107.09**	**70**
1	Ri Bhoi	2011-12	Upper Bagan	Umling	10,00,000.00	12.00	15
Sub Total					**10,00,000.00**	**12.00**	**15**
1	Jaintia Hills	2007-08	Umkiang	Khliehriat	8,56,600.00	10.00	12
Sub Total					**8,56,600.00**	**10.00**	**12**
1	Jaintia Hills	2010-11	Rwan Mynsar	Laskein	1,88,900.00	1.53	3
2	Jaintia Hills	2010-11	Ummulong	Thadlaskein	4,98,400.00 6	6.00	4
3	Jaintia Hills	2010-11	Amsohlashan	Amlarem	2,42,500.00	2.00	7
4	Jaintia Hills	2010-11	Amthery	Amlarem	4,59,714.00	5.00	6
5	Jaintia Hills	2010-11	Priang Marang	Amlarem	5,47,720.00	5.00	20
6	Jaintia Hills	2010-11	Waham-Hep	Amlarem	4,73,820.00	4.00	6
7	Jaintia Hills	2010-11	Ampadong	Amlarem	4,97,500.00	5.00	5
8	Jaintia Hills	2010-11	Sungladaw	Laskein	4,65,200.00	12.00	2
10	Jaintia Hills	2010-11	Myntrong Pdeng	Laskein	4,57,600.00	10.50	3
11	Jaintia Hills	2010-11	Rangdolloi	Laskein	3,62,600.00	3.00	3
12	Jaintia Hills	2010-11	Sapiangrah	Laskein	4.70,300.00	9.00	2
13	Jaintia Hills	2010-11	Pasyiang	Laskein	4,48,400.00	9.86	7
Sub Total					**54,62,654.00**	**83.75**	**75**
1	Jaintia Hills	2010-11	Am Majaw	Amlarem	11,98,950.00	12.00	12
Sub Total					**11,98,950.00**	**12.00**	**12**
1	East Garo Hills	2007-08	Wakopgre	Songsak	3,20,500.00	3.20	8
2	East Garo Hills	2007-08	Akelgre	Samanda	2,17,300.00	4.50	6
Sub Total					**5,37,800.00**	**7.70**	**14**
1	East Garo Hills	2010-11	Sambrak	Kharkutta	5,50,300.00	5.80	4
2	East Garo Hills	2010-11	Rongmatchu	Kharkutta	5,10,000.00	3.30	4
3	East Garo Hills	2010-11	L.Rongmatchu	Kharkutta	4,01,800.00	4.41	1 5
4	East Garo Hills	2010-11	L.Manikganj	Resubelpara	5,10,050.00	6.50	9
5	East Garo Hills	2010-11	Mongpanggro	Resubelpara	3,10,000.00	3.70	9

6	East Garo Hills	2010-11	Tharkurbilla	Resubelpara	4,30,850.00	4.10	7
7	East Garo Hills	2010-11	Taka	Songsak	5,39,400.00	2.00	11
8	East Garo Hills	2010-11	Norek Megapgre	Sonsak	5,38,100.00	2.70	10
9	East Garo Hills	2010-11	Damegre	Samanda	7,75,800.00	3.50	10
10	East Garo Hills	2010-11	Goma	Samanda	2,79,500.00	4.00	5
Sub Total					**48,45,800.00**	**40.01**	**74**
1	East Garo Hills	2011-12	Bugasik	Songsak	7,28,900.00	5.80	8
2	East Garo Hills	2011-12	Gorok	Kharkutta	6,47,400.00	6.50	7
3	East Garo Hills	2011-12	Warengro	Samanda	7,22,200.00	6.10	11
Sub Total					**20,98,500.00**	**18.40**	**26**
1	South Garo Hills	2007-08	Daragre	Gasuapara	11,53,200.00	11.00	10
2	South Garo Hills	2007-08	Nengsra	Rongara	13,87,600.00	13.00	9
Sub Total					**25,40,800.00**	**24.00**	**19**
1	South Garo Hills	2010-11	Waikal	Rongara	4,88,600.00	8.00	8
2	South Garo Hills	2010-11	Konagittin	Gasuapara	17,50,000.00	18.00	15
3	South Garo Hills	2010-11	Tiwan	Rongara	15,14,800.00	12.00	12
Sub Total					**37,53,400.00**	**38.00**	**35**
1	South Garo Hills	2011-12	Banipara	Gasuapara	7,50,000.00	7.50	8
2	South Garo Hills	2011-12	Banjakona	Gasuapara	7,00,000.00	7.50	5
3	South Garo Hills	2011-12	Dobajol	Rongara	8,72,250.00	8.00	8
Sub Total					**23,22,250.00**	**23.00**	**21**
1	West Garo Hills	2007-08	Jewelgre	Betasing	8,24,900.00	9.00	9
2	West Garo Hills	2007-08	Simrokgre	Rongram	8,86,300.00	8.50	7
3	West Garo Hills	2007-08	Ganol Sangma	Rongram	7,47,600.00	7.00	10
Sub Total					**24,58,800.00**	**24.50**	**26**
1	West Garo Hills	2010-11	Chelipara Ageng	Zikzak	6,70,500.00	9.00	7
2	West Garo Hills	2010-11	Chandan	Betasing	6,90,600.00	4.80	13
3	West Garo Hills	2010-11	Chengjhora	Selsella	8,15,700.00	5.50	20
4	West Garo Hills	2010-11	Grimjong	Selsella	12,04,200.00	65.00	32
5	West Garo Hills	2010-11	Seel	Gambegre	7,54,400.00	5.50	15
6	West Garo Hills	2010-11	Suringga	Betasing	7,56,000.00	5.50	18
7	West Garo Hills	2010-11	Mondolpara	Zikzak	10,20,600.00	10.00	14
8	West Garo Hills	2010-11	Jambal	Zikzak	9,45,000.00	10.00	12
9	West Garo Hills	2010-11	Deldella	Selsella	9,41,400.00	32.00	25

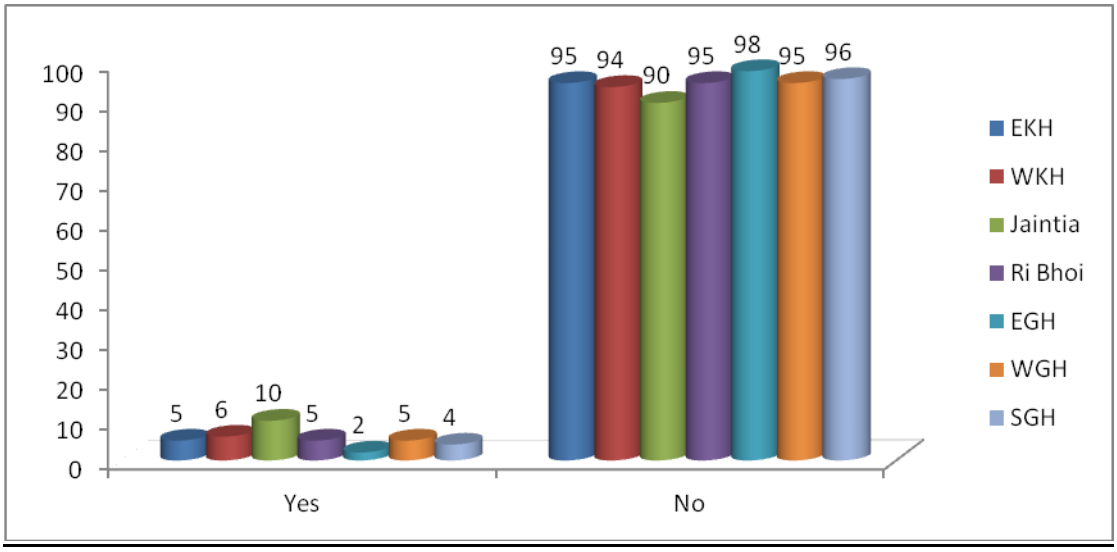
Sub Total					**77,98,400.00**	**147.30**	**156**
1	West Garo Hills	2011-12	Gonchengre	Selsella	10,17,000.00	12.00	26
2	West Garo Hills	2011-12	Jangrapa	Dadengre	7,51,000.00	7.00	12
3	West Garo Hills	2011-12	Jamdamgre	Selsella	6,06,000.00	6.00	12
Sub Total					**23,74,000.00**	**25.00**	**50**
Grand Total					**`625,97,652.00**	**902.34**	**921**

It was found from the study that under RKVY scheme from 2007-08 to 2011-12 out of total 921 families benefitted through WHS, the maximum no. of families benefitted were from West Garo Hills district i.e 232. Out of these beneficiaries 115 were from Selsella block of this district. During the field visit, out of the target beneficiaries of this block approx. 60% were reported that they are satisfied with this scheme. After this district the second most benefitted district was West Khasi Hills, in this district WHS benefitted 195 beneficiaries. In this district the most benefitted block was Mawthadraishan. It was also found that under this WHS one school also have got benefitted that is from Mawsynram Block of East Khasi Hills district. The photographs of some of the structures constructed under the WHS are shown below:

SAITSOHPHLANG WHS

3.41: Formation of Water Users Association (WUA) (in %)

Table 3.18: Formation of Water Users Association (WUA) (in %)



Almost in all the districts there is not much emphasis on formation of Water Users Association (WUA), even though it is being formed in districts, the participation is not there. Even most of the beneficiaries are not fully aware of the purpose of formation of WUA. In the state of Meghalaya, there is a need for participatory approach on irrigation management, which can be done through WUA. The formation of a reliable WUA can help in maintenance and renovation of completed Minor Irrigation (MI) schemes in the state.

3.42 Impact of Water Harvesting Scheme

Meghalaya is predominantly a hilly terrain with limited valley areas at places. The average annual rainfall in the state is around 2,050 mm. Though, the state is endowed with the plenty of rainfall, it experiences shortage of drinking water during the summer. This may be due to high surface run off, as the area is hilly with steep slopes. The main water supply is dependent on spring, streams and waterfalls.

Rainwater Harvesting is a popular term used for a tradition of collecting rainwater, improved by modern concepts and technologies, a result of more than two decades of research work around the globe. Effective management of rainwater harvesting and aquifer recharge is becoming an increasingly important aspect of water resources management strategies. Growing earth population over the last few decades and the advent of submersible pumps resulted in over utilizing the storage capacity of aquifers, with, to the extent that many aquifers are now being exploited at rates far in excess of natural recharge. Rainwater harvesting as one component of a watershed management strategy can only succeed if used in conjunction with demand management appropriate for the socio-economic setting.

Watershed management involves the identification, planning, policy-making, and adoption of a set of measures and activities to conserve and reclaim basic resources with reasonable exploitation of the natural resources in a watershed without adverse impacts on the natural environment. It is essential in watershed management to consider and to take account of all economic, social, cultural, and institutional factors involved in the watershed as well as the external factors affecting the interactions within the watershed with due consideration to the nature of the ecosystem in the watershed. The enhancement of the vegetative cover (natural forest, range, or farm plants) and the resulting improvement of the livelihood of the local community (farmers, livestock breeders, and users of the forest and rangeland by-products) is one of the corollary impacts of soil and water conservation and the increased soil moisture. In other words, it may be concluded that watershed management activities are multi-purpose activities that are cost-effective and economical while their execution calls for very simple and low cost technologies that can be easily implemented and scaled up by local communities.

The benefits of watershed management projects include benefits resulting from water directly harvested, from water harvested after recharge or infiltration, from erosion control, sedimentation control, or from animal feed produced, from agricultural production, and from flood damage control as measured by previous events.

3.43 SWOT ANALYSIS of the scheme

SWOT analysis is a strategic planning method used to evaluate the Strengths, Weaknesses/ Limitations, Opportunities, and Threats involved in the implementation of a project. It involves specifying the objective of the project and identifying the internal and external factors that are favorable and unfavorable to achieve the objectives of the project. Setting the objective should be done after the SWOT analysis has been performed. This would allow achievable goals or objectives to be set for the organization.

- Strengths: characteristics of the project team that give it an advantage over others
- Weaknesses (or Limitations): are characteristics that place the team at a disadvantage relative to others
- Opportunities: external chances to improve performance (e.g. make greater profits) in the environment
- Threats: external elements in the environment that could cause trouble for the project Identification of SWOTs is essential because subsequent steps in the process of planning for achievement of the selected objective may be derived from the SWOTs.

A SWOT analysis was done for the PIA and the result is as follows:

Strength:

a. Strong linkages with line departments for technical guidance.
b. Scientific planning with the help of Water Resource Department.
c. State level and District level committees for monitoring, coordination & Cooperation.
d. Previous knowledge of convergence with various line departments
e. Prior acquaintance of officers with the villagers of selected project area, hence ease in implementation of project.
f. Well informed farmers and general public

Weakness:

a. Inadequate infrastructural facilities
b. Various schemes are being implemented by the PIA with limited human resources.
c. Shortage of reputed training centres for capacity building at village level to ensure the proper implementation of the project.

Opportunities:

a. A number of different other development schemes of the government are running; so, there can be horizontal integration and convergence of programmes.
b. Neighbourhood Groups, User groups and Self Help Groups
c. Better financial provision under IWMP, better quality of work can be expected
d. Usage of new ICT tools like GIS, GPS and MIS integration of the project with the State Level Data Cell for online monitoring and evaluation.
e. Can easily identify and resolve the problems of the area
f. Transparency in Accounting System

Threats:

a. Rainfall being very scarce and unreliable in the project area, the activities planned to be taken up may yield limited impact.
b. Overloaded work may mislead the watershed project or may divert the vision at the time of implementation of the projects of IWMP
c. Options in production system are limited due to the lack of sufficient natural resources and due to limited resource base.
d. Irregularities in fund flow can derail the smooth functioning.
e. Political interference can dissatisfy the team to work properly.

3.44 Feedback and Success Story of RKVY Scheme under Water Resource Department

SOHPIAN RAIN WATER HARVESTING STRUCTURE:

Sohpian RWH is located on the R.H.S. of Shillong – Nongstoin National Highway 44E Road at about 8Km from Nongstoin Town and it has a command Area of 13.72 hectares. Prior to the construction of the Project, the Farmers have to depend for the water requirement of crops on rainfall, and the yield is very less. The main crop is paddy and it was practiced only during Kharif season. But after construction of the project, it has been seen that water is available throughout the year and the farmers can also grow Rabi crops such as carrot, cauliflower, beet roots and others vegetables. The yield of crops has been increasing and thus the economic condition of the people has greatly improved.

The farmers of the Area are also made aware of the importance of Agriculture. As the Area is very near to Nongstoin town, there is also a good scope of market and the farmers will be encouraged to practice double cropping or multi-cropping.

The Dam was constructed across a small perennial stream. The ponding area is about 2000.00 square meters having an average depth of 2.50 meters. The water body thus created not only gives benefit for fish rearing but also acts as artificial ground water recharger. The Dam was designed as vertical drop weir having a footbridge to cross to the other bank and the outlet was also provided so that surplus discharge may also serve the purpose for domestic use. It has also now become one of the small tourist spots of Nongstoin town.

Mawpran Rain Water Harvesting Scheme Under RKVY.

Mawpran Rain Water Harvesting Scheme at Mawpran Phlang Swang village under Pynursla C & RD Block of East Khasi Hills District in Meghalaya was constructed at an estimated cost of Rs. 4,98,200.00 (Rupees Four lakhs ninety eight thousand two hundred) only sanctioned vide letter no. CE/IRRI/20-Sch/2010-11/249 Dated Shillong the 16th March 2011.

The scheme was completed on March 2012 well to the expectation of the farmers especially during the winter spell where shortage of water is a stumbling block for farmers eager to take up multiple cropping. The schemes caters to a command area of 3.85 Ha where strawberry, vegetables are grown benefitting 5 (five) families. The project consists of a stone masonry check dam with C.C. core of height 2.00 m and span 15.00 m across Iarkhaii stream. The check dam was constructed on firm and hard soil strata to ensure that there is no seepage loss from the structure. Raising the check dam to a height of 2.00 m above the natural ground and provision of wing walls on both sides of the check dam gave sufficient storage of water upstream of the stream. The storage thus created enable the farmers to irrigate their crops during the non-monsoon periods. Water from the impounded structure is diverted to the command area through 25 mm dim G.I pipe for a length of 448.00 Rm. The existence of this pool of water will also help in recharging the ground water table of the area and also provide the farmers with the opportunity to participate in allied farm activities like pisci-culture, duckery, etc, which will go a long way in supplementing their income.

VIEW OF THE CHECK DAM AT MAWPRAN RWH UNDER RKVY 2010-11

UPSTREAM VIEW OF THE CHECK DAM AT MAWPRAN RWH UNDER RKVY 2010-11

COMMAND AREA OF MAWPRAN RWH UNDER RKVY 2010-11

3.45 Photographs of WHS

ATHIABARI WHS

MAWPRAN WHS

TIEHNONGSIEJ WHS

3.46 Suggestions and Recommendation

- There is need for more involvement of unemployed educated youth in the process of development of wastelands and degraded lands. This will help them in achieving the means of livelihood as well as in ensuring their involvement in the mainstream development of the state.
- The Capacity building and training should be well designed at the planning phase and imparted before execution of watershed related activities. The training module should also include post project maintenance aspects to address the sustainability aspect. Detailed training calendars, training manuals on various aspects of watershed development need to be prepared keeping into consideration site specific and scheme specific requirements. It is necessary that the capacity building should commence from the planning phase itself and should continue even in the post project phase.
- There exists a provision of cost sharing by the beneficiaries in some of the activities. of watershed programmes. The objective of keeping such provision is to have a sense of belongingness, accountability and responsible partnership of the beneficiary in the programme. There is need to incorporate more such components for further encouraging such sharing for success and sustainability of the programmes.
- New technology should be developed and adopted for rain water harvesting and recharging of aquifers.
- The policy for water harvesting and aquifer recharge are supposed to be formulated by the Government body, NGO's and premier educational institutions.
- Exploitation of water resources should be in the right proportion, ensuring the hydrological balance.
- Conservation of forests, afforestation and conservation of the soil profile should be undertaken into account for better management of water balance and to check the siltation in the water reservoirs.
- Plans for Command Area Development should be taken into account.
- General public should be involved for ensuring a success of the development of the water harvesting projects.

- Aquifers recharging programmes should be initiated for better water harvesting and Existing aquifers should be optimally used only during the scarcity period.
- Groundwater development programme should be limited to replenish able quality. Artificial recharge should be provided in areas where such technology is available. Percolated tanks are of special interest in this connection and it should be planned taking geological and hydrological features into account.
- Participation of farmers, community and voluntary organizations is highly necessary for a large scale practice of water harvesting, water conservation and recharging of aquifers.
- All efforts should be made to save water in all Command Areas by modified cropping, conjunctive use and modernization of irrigation system and water harvesting structures.
- Integrated watershed Management approach is recommended for optimum development of land, water and plant resources within the natural boundaries of a drainage area to meet the basic minimum needs of the people in a sustained manager.
- Specific programmes should be initiated to locate suitable topographical, hydrological and geological sites which should be developed as water resources by converting them into aquifers.

Soil and Water Conservation Department

As one of the major development partners in the State, the Soil & Water Conservation Department is entrusted with the task of natural resources management in particular soil, water and vegetation resources. By adopting and applying appropriate soil and water conservation techniques and measures, perpetual utilization of the said resources can be achieved. These three basic life support systems when managed effectively will ultimately lead to sustainability and promote need-base, economic and ecological development. The Soil & Water Conservation Department, Meghalaya originated as the Jhum Control Wing under the Forest Department in the erstwhile composite State of Assam .It was subsequently created as an independent Department during 1959-60.

As a major Department of the State, the Department has been striving towards the conservation of the three most vital natural resources - soil, water and vegetation by implementing various conservation measures. Accordingly the Department has taken up the following as its main functions:

1. Conservation of natural resources like soil, water and vegetation for sustained development and continuing economic progress and improved way of life of the people.
2. To combat destructive agricultural practices of shifting cultivation or Jhumming to preserve, maintain and improve balance in ecology and environment
3. Maximum utilization and conservation of soil, water and vegetation in the catchment areas by making judicious use of land according to its capabilities.

The term soil conservation includes the preservation and restoration of lands. The soil management practices safeguard the soil against depletion by natural and anthropogenic activities. In most of the agricultural fields, soil erosion is minimized through traditional methods such as by using bamboo culms, stones and gunny bags filled with soil.

3.47 RKVY scheme under Soil and Water Conservation Department

The area of focus of this programme is for the development of Rainfed Farming Systems in and outside watershed areas as also integrated development of watershed areas, wastelands, river valleys and for activities relating to enhancement of horticultural production and popularization of micro irrigation systems. The thrust area is to promote regeneration of topsoil, its health and tilts

and to improve soil fertility, crop production, land and water productivity of watershed areas, wasteland, river valleys/valley bottom lands and the eco-system as a whole. The fund is released by the State Agriculture Department for the schemes approved for implementation by the Soil & Water Conservation Department. Amongst other, the basic feature under RKVY is that the districts are given sufficient fiexibility under the scheme to make appropriate local choices so that the outcomes are as envisaged in the aims & objective.

Project Component

a) Conservation Technology Adoption : Adoption of appropriate Soil & Water Conservation techniques & measures (Biological Agronomic and Mechanical/Engineering) - 85% (Rs.14,000/- per hectare)

b) Livelihoods - 15 % (Rs. 2,500/- per hectare).Per unit area costing : Rs. 16,500/- per hectare

The livelihood component includes: fisheries, field crops, sericulture, piggery, nurseries, poultry, floriculture etc.

Table 3.20: Physical status of RKVY

Sl.no.	Name of the scheme	Year	Works undertaken (in nos.)	Achievement (in Ha.)
1	Enhancing agriculture production and productivity of river valley/bottom land.	2009-10	07	1450
2	Improvement of agriculture crop production/productivity of Jhum (abandoned/cultivated land)	2009-10	07	1452.06
3	Improvement of traditional water conservation system and distribution system.	2009-10	02	140
4	Restoration of cultivable land affected by mining and quarrying.	2009-10	03	110
5	Enhancing agriculture production and productivity of river valley/bottom land.	2010-11	07	2950
6	Improvement of agriculture crop production/productivity of Jhum (abandoned/cultivated land)	2010-11	07	3146
7	Improvement of traditional water conservation system and distribution system.	2010-11	02	800
8	Restoration of cultivable land affected by mining and quarrying	2010-11	00	00
	Total		**35**	**10048.06**

In the last three year the department has undertaken several projects for the improvement of traditional water conservation system and agricultural productivity in the state. Apart from these steps were also taken for restoration of cultivable land affected by mining and quarrying. Around 35 works were undertaken under different schemes in 10048.06 hectares.

3.48: Various Jhum control scheme

Shifting cultivation or slash and burn agriculture is the most prevalent form of agricultural practice of the ethnic people and is commonly called *Jhum* cultivation, which is one of the most ancient systems of farming believed to have originated in the Neolithic period around 7000 B C. This system is a primitive cultivation technique and is transition between food gathering and hunting to food production. The system of farming is still in vogue in Meghalaya. About 350,000 people practice shifting cultivation on about 4,160 km² of unsurveyed land. Shifting cultivation is a very wide term covering a number of very different forms of land use, it's essential feature being that the land is cleared and agricultural crops are grown for a limited period, which may range from one to over ten years, after which the cultivation is moved to a new site. The cultivators may or may not intend to return to the old site after the fertility of the soil has recovered.

The practice of Jhum cultivation is short and has a variable fallow period. In general, hill people who live in tropical region practice shifting cultivation. After a piece of land is selected, trees or bushes are cut down partially or fully, left to dry and then burnt *in situ*. In the cleared land, seeds of crops are dibbled into holes or broadcast, without using ploughs or animal power. When the crop yield begins to decrease after some years, the cultivator moves to a new patch of forest to repeat the process, and allows the abandoned land to recuperate. After a period varying from 2-20 yrs, they return to the same land for cultivation. At present the duration of the fallow cycle has been reduced to 3 – 5 yrs in most of the northeastern states of India, this may be due to overwhelming pressure on land. Shifting cultivation is the most primitive form of cultivation of agricultural crops. This practice has continued for thousands of years and stood the test of time. This practice has an in-built mechanism of sustenance and conservation. However, due to anthropogenic pressure on land use for shifting cultivation adversely affecting eco-restoration and ecological process of forests. This leads to degradation of land causing soil erosion and finally converting forests into wastelands.

Shifting cultivation is mostly practiced in community forests of Meghalaya. In the state, the village council commonly called *Dorbar Shnong* owns the land, and allots the forestland for cultivation. The main interest of the cultivators is to produce almost everything that they need to fulfill their requirement.

3.49: Finding of Various Jhum control scheme

The Soil and Water Conservation Department has taken several steps under the Jhum control scheme focusing on Land Development, Afforestation, Water Conservation and distribution works, Cash crop development, Follow-up programme, Camp and camp equipments, Dwelling house, link roads etc.

Expansion of terraced land in the hilly areas of the region enhances the importance of irrigation facilities. To increase the farm efficiency in crop production the application of irrigation facilities for timely supply of water is a must which makes even the small holdings economically viable. But most of the terraced lands constructed by the Government and allotted to the jhumias are dry terraced. Even where irrigation is introduced, it cannot water the entire fields in time as in the case of Darengiri (Garo Hill) terrace fields. The role of middlemen in procuring agricultural products is another problem. The middlemen exploit the farmers and the farmers do not get their due share for their produce. The monopolist traders of Shillong have been exploiting the pineapple and potato growers of Meghalaya.

It is learnt that the soil of an area where various measures of jhum control scheme are introduced are not scientifically analyzed as to its suitability for the crops to be introduced there. The result is obvious crop failure in many cases. This has totally discouraged the jhumias. In spite of the evil effects of shifting cultivation, there is a surety of crop for the farmer. Because as mixed cropping is the general pattern of shifting cultivation, the farmer gets the production of certain crops even if some other crops in his farm are damaged.

3.50 Success Story under RKVY

AT THYNROIT VILLAGE

Thynroit village is located in the North Eastern side of the East Khasi Hills District at a distance of 35 KM from Shillong, the state capital of Meghalaya. It falls within the jurisdiction of Mawkynrew C & RD Block. The people residing in the village are mostly farmers and depend solely on agriculture for their livelihood. Due to the scarcity of water and lack of proper irrigation facilities the farmers mostly follow mono-cropping i.e. only paddy (*Kharif*) with yields of about 1.3 metric tonne per hectare.

Implementation of Rashtriya Krishi Vikash Yojna (RKVY):-

During the year 2009 – 2010, the Scheme component of Soil & Water Conservation under Rashtriya Krishi Vikash Yojna (RKVY) was launched in the village with a total project cost of Rs.3.30 lakhs for improving the production of agricultural produce. The main objective of the scheme is to achieve 4 % annual growth in the agriculture sector through holistic development of agriculture and allied sectors. The implementation of the Scheme was completed during 2010 – 2011 and various conservation and land development works were taken up. Constructions of check dams and farm ponds under the programme have improved groundwater levels in the project area. Water harvesting projects have helped in assuring irrigation, enabling the farmers to adopt double cropping with *rabi* vegetables in the post monsoon season, doubling the cropping intensity and elevating the household income of many families. Resource conservation by means land development projects such as land leveling, contour, terracing and graded bunding were also carried out.

Table No 1: -Yield of Crops in the Project area

Name of Crops	Pre-project	Post-Project
Paddy	**1.3 M.T.**	**1.4 M.T.**
Potato	**6.4 M.T.**	**8.20 M.T.**
Cabbage	**17.0 M.T.**	**18.1 M.T.**

CHECK DAM AT THYNROIT VILLAGE

DUG OUT POND AT THYNROIT VILLAGE

AT WAH UMSTAIT VILLAGE

A group of farmers of about 20 families, who depend mostly on Horticulture crops viz. betel leaf and black pepper for their livelihoods from Wah Mawlein Village under the Mawkynrew C & RD Block of East Khasi Hills District Meghalaya, were identified for extending assistance by providing assured irrigation from the scheme Rashtriya Krishi Vikash Yojna (RKVY) 2010 - 2011. Prior to the intervention under the RKVY Scheme , the farmers have been using indigenous bamboo irrigation method to irrigate their crops especially betel leaf, where farmers use channels made out of bamboos to convey water to irrigate their crops during lean season. This traditional/Indigenous method of irrigation requires constant attention and maintenance, besides, irregularity, inadequate quantity of water is available for irrigation which ultimately led to the rise in the cost of production.

In an effort to improve the irrigation system of the identified farmers, the Department of Soil & Water Conservation, under the RKVY Project, constructed 1 (one) check dam/head dam for better impounding of the water at the source. Two storage/distribution tanks were also constructed forstorage and better distribution of water to the fields. For uninterrupted and better supply of water to the plantation area and to reduce the maintenance and repair cost , bamboo channels were replaced with GI pipe line (about 1200meters) to irrigate about 50 hectares betel leaf plantation area.

The farmers benefitting from the project have formed a Water Users Association in the name of "Wah Umstait Water User's Association" for taking the responsibility to take care of the maintenance and the upkeep of the structures constructed. The Association was registered under the Registration of Society Acts 12 of 1983 and the Registration No. is P.16/5 of 2012/163 Dt.04.10.2012. Users' fees introduced by the Association is Rs100.00 per month from each member to generate fund for maintenance of the assets created.

Through the intervention by the said scheme, there have been significant improvement in the yield of different crops especially betel leaf where the yield has increased by 15 percent. With the availability of increased and assured irrigation, more area will be taken up under different crops by the farmers in future.

Check dam/head dam at the source (intake point)

Traditional/Indigenous method of irrigation

Storage/Distribution Tank

Bamboo channels replaced by GI pipe line

IN RI BHOI DISTRICT

Focused Interventions:

Scheme I: Soil & Water Conservation Measures for enhancing crop production & crop productivity in river valleys.

Scheme II: Soil & Water Conservation Measures for improving crop production and productivity of cultivated and abandoned *jhum*/bun lands

Impact assessment on the following works implemented:

- Land development like wet terraces, contour bunds/ graded bunds which were constructed on lands which were left unutilized/barren or on abandoned *jhum*/bun lands.
- Head water dams, check dams with irrigation canals constructed to provide assured irrigation facility to paddy and life saving irrigation for vegetable crops taken after paddy in *rabi* season.
- Water harvesting structures constructed to harvest and conserve rain and perennial water and for provision of life saving irrigation to *rabi* vegetable crops and for pisciculture.
- Improvement, extension of paddy fields for improving crop production and productivity.
- Protection of paddy fields and agricultural lands from river/stream banks erosion by constructing retaining walls, protection walls.
- Provision of seeds and horticultural seedlings and manure for planting in the new developed lands and in existing paddy fields.
- Provision of livelihood supports to the deserving families.

The above interventions have profound benefits to the farmers and it has achieved the aims and objectives in enhancing crop production & crop productivity in river valleys, improving crop production and productivity of cultivated and abandoned jhum/bun lands and generating livelihood opportunities to the farmers. Due to assured irrigation benefits, net returns from a unit land has increased not only in yield but in cropping intensity, the farmers has taken two crops now, a paddy – vegetables sequence instead of a single crop of paddy practiced before the project implementations and the activities are able to sustain and improve the living standard of the farmers.

SOIL & WATER CONSERVATION MEASURES FOR IMPROVING CROP PRODUCTION AND PRODUCTIVITY OF CULTIVATED AND ABANDONED *JHUM*/BUN LANDS

A steep Jhummed land converted into wet terraces –assured irrigation are provided from the head water dam beyond the hillock with irrigation channels.

Contour bunding constructed on the previously *jhum* land and planted with

SOIL & WATER CONSERVATION MEASURES FOR ENHANCING CROP PRODUCTION & CROP PRODUCTIVITY IN RIVER VALLEY/VALLEY BOTTOM LANDS

Head water

Irrigation channel to the paddy fields


Vegetables grown on paddy fields as Rabi crops


New contour bunds and terraces under construction at Lummawspeng, Umbuda

3.51 SWOT Analysis of RKVY scheme under Soil & Water Conservation Department

Strength	Weakness
➢ Rich biodiversity ➢ Soil is rich in organic matter ➢ Potential to commercialize products ➢ Adequate land resource. ➢ Good climatic season. ➢ Beautiful topography attracting tourist. ➢ Suitable Soil for Horticulture ➢ Tremendous growth of cane and bamboo. ➢ Farmers have traditional competencies in Jhum cultivation process ➢ Rural based farmers' unity and mutual understanding ➢ Coordination between male and female in labor segragation	➢ Lack of infrastructural facilities along with the value chain ➢ Limited flow of men and materials due to hilly terrain ➢ Non-availability of skilled manpower ➢ Deforestation due to Jhum. ➢ Land Slide & Land depression. ➢ Poor surface communication. ➢ Natural calamities, Cyclone, erosion of roads. ➢ Poor telecommunications. ➢ Inadequate marketing facilities of agriculture Handloom and live stock products. ➢ Facing hazards in taking loan from Bank ➢ Lack of information about market price and market demand
Opportunities	**Threats**
➢ Market demand of agricultural products are existed ➢ High market demand in respect of organic products ➢ More Agricultural land can be used. ➢ Huge scope for value addition of surplus produce ➢ Jhum can be replaced by permanent cultivation. ➢ Horticulture product can be grown more for canning. ➢ Live stock production can be increased. ➢ High market price during pre-harvesting period	➢ Slow growth of infrastructural links ➢ Uncertainly in external trade scenario ➢ Recurring land slide, Land degradation. ➢ Jhum cultivation destroying forest. ➢ Production increases without studying the marketing facilities. ➢ Negative approach of market syndicate Biasness in implicating the laws and regulation ➢ National and Regional political unrest ➢ Rate of afforestation and land grabbing ➢ Unpredictable climate behavior

3.52 Suggestions and remedial measures:

There needs to be inclusion of affected person's perceptions, opinions and defined needs in the planning of any mitigation actions so that local realities and local priorities are properly incorporated. The planning and design process under restoration scheme needs to suit all interested parties and their issues such as later access rights by different sections of the community. The planning and design processes needs to be linked to the form of the forest restoration as plantations (single or multiple species, timber or multi-use species). There is a need to consider further the possibilities of designing water storage and water supply systems in restoration and reclamation schemes.

There is lack of co-ordination among the agencies which are directly involved in the implementation of the jhum control schemes and other allied agencies. These agencies should come forward with technical knowledge and other helps. The Soil Conservation Department is implementing the jhum control scheme in Meghalaya; but it was alleged that the Agricultural Department is not cooperating with the Soil Conservation Department with its available resources. As a result even an enthusiast farmer finds him at a loss as to what to do at certain stage. Finally, he has to give up the idea of going with the Jhum Control Scheme and he retreats to his jhum land.

Considering the evil and deleterious effects of shifting cultivation, it is quite important to adopt a broad based strategy for changing the status of such cultivation in the mind of the tribal people of NER as well as to motivate this tribal people from their nomadic agricultural practices into a settle and permanent agricultural practice. The following measures are to be helpful to control shifting cultivation in the region: –

- In controlling of shifting cultivation, a successful way is to settle the jhum on an irrigated terrace by channeling water from mountain streams. This type of cultivation is known as terrace cultivation which is very much popular in Khasi, Jayantia hills of Meghalaya. Thus, adequate steps must be taken to introduce irrigated terrace cultivation in the other parts of the region.
- Solution to the problem of shifting cultivation requires the settlement of tribal families on permanently settled agriculture. This will require development of land for regular cultivation which again requires a huge investment and many years. Considering the physiographic

characters of land, climatic conditions, social conditions, food habits etc., alternative system of farming like diversified farming should be introduced. This would require a system which includes agriculture, horticulture along with animal husbandry, fishery, poultry farming etc.

- The State as well as Union Governments and promotional agencies should come forward with forefront initiative to take up intensive and extensive cultivation of plantation crops (tea, coffee, rubber, pineapple etc.) and for the development of non-forest wasteland in the region. Recently, in Assam the Government has decided that a large area of the non-forest wasteland would be brought under 'rubber block planting' scheme where more than 65% of the total investment would be contributed by Rubber Board of India and the rest would be financed by the state government. This type of scheme should be implemented for other plantation crops in the all states in the region so that it increases the employment opportunity in the hill region.
- To reduce the population pressure on cultivable land in hill areas, Government should make adequate legal provisions to keep in check the flood of infiltration from other parts of India and the neighboring countries, so that the benefit of controlling measures of shifting cultivation and employment opportunity will be enjoyed by the local people. Besides, the degraded jhum land should be developed into Special Agricultural Zones (SAZ).

3.53 Remedial measures

Under the present context, the concept of 'Sustainable Agricultural Development' can be an effective strategy for ensuring adequate supply of food, fibre, fuel and other amenities to the growing tribal population in the region. This strategy will pave the way for improving the living standard of the tribal people and also create a sense of security in their life as well. This concept of sustainable development of agriculture will also give due recognition to the geophysical and environmental factors of the region for developing a sound agricultural pattern for the people of this hilly region. Scientific studies suggest that mixed land use system is quite suitable for hilly areas from the point of view of production as well as conservation. In this context, the latest and most effective land and water management techniques, popularly known as 'Watershed Management programme' along with land development, soil conservation, agriculture, horticulture, plantation crop, forestry, animal husbandry and fishery can safely be considered as most vital and important strategy. The alternatives which may come in the way include:

- Agricultural (settled) land use system through terracing and contour binding;
- Horticulture and cash crop plantation land use system for developing fruit orchard, rubber, coffee and oil palm cultivation.
- Multi-storey cropping land use pattern for differential harvesting of solar energy utilization of soil fertility at variable depth.
- Agri-Horti-Silvipastoral land use system with the strategy to adopt agriculture at the foothills, horticulture at the mid-portion of the hill slope and silvipastoral land use at the top of the hill.
- Livestock based land use system for developing livestock farming along with fodder production system.

Fisheries Department

The Department of Fisheries was created in the year 1974. Prior to this it was under the Department of Agriculture. Its Vision is to develop fish culture and to create more water area. The Department maintains data in a catalogued and index form, computerize all appropriate records and facilitate access through a country-wide network on different systems. The Directorate Office issues necessary instruction and guidelines etc. to the subordinate Office at the District & Sub-Divisional level with a view to streamline the developmental activities of the Department.

Meghalaya with its vast inland fishery resources offers tremendous scope for developing the fisheries sector, but lags behind in harnessing the potential of these natural resources. Though the state is predominantly a fish consuming State, the supply of fish is inadequate to meet its growing demand, making the State import fish from Andhra Pradesh. The Government of Meghalaya has identified fisheries as a key sector and has decided to launch the Meghalaya State Aquaculture Mission (MSAM) co-terminus with the Twelfth Five Year Plan period (2012-13 to 2016-17). The MSAM has the following major objectives:

1. Development of existing water bodies and creation of additional water area for large scale fish production, including reclamation/rehabilitation of marshy and swampy lands,
2. Conservation of native, endangered and traditional species of Meghalaya and developing breeding farms of commercially potential species on a large scale,
3. Creation of mass awareness, capacity building, exposure training and skill development of all the stakeholders and technical support for long term sustainability of fishery sector,
4. Capturing emerging opportunities in the fisheries sector.

As compared to all other departments, Fisheries department lacks in infrastructure facilities and manpower for proper monitoring of the schemes implemented under RKVY at district level. Through the pond expansion scheme there has been upliftment in the socio economic condition of the fish farmers, but there needs to be more awareness and capacity building activities for the participation of beneficiaries in a right path. They need to understand the benefit of fishing and the changes it can bring in their life style.

3.54 Type of technology adopted for up-gradation and modernization

The technology is adopted under the Central Institute of Fresh Aquaculture. Development of freshwater aquaculture technologies for increasing production and productivity is mostly include technological interventions to enhance quality and production of fish through incorporation of new candidates or improvement of existing breed quality, standardization of their seed production technology and aspects related to the nutrient management for productivity improvement. The new species are included into the culture system only after detailed study on their biology, seed production and grow-out performance. Formulation of low cost feed formulations and feeding strategies has been made through evaluation and incorporation of locally available alternate feed ingredients, floating or sinking pellets. The success indicators for health management has covered development of diagnostics, production of bioactive compounds from aquatic algae, and probiotics for better environment management, training programme for capacity building and skill upgradation for state officials involved in fish health management. It has been measured through development of number of diagnostics, purification and characterization of bioactive compounds to destroy fish pathogens, and conducting training for state officials.

Cage and Pen Culture

Amongst the known modern aquaculture systems for increased fish production, cage and pen culture are about the cheapest to operate. A cage is a system that confines the fish or shellfish in a mesh enclosure and Pen is an enclosure to grow fish or prawn in a large water body. Modern cage culture began in the 1950s with the advent of synthetic materials for cage construction. Today cage culture is receiving more attention by both researchers and commercial producers. Factors such as increasing consumption of fish, some declining wild fish stocks, and a poor farm economy have produced a strong interest in fish production in cages.

Cage aquaculture technology is of recent introduction in India and has advantages in many respects to increase fish production levels. Cage culture is i) compatible and not competitive with other fish production system and complementary to some, ii) raising of fish in cages is an alternative means of fish production, iii) applicable to most aquaculture species, including predatory fishes, iv) ideally applicable in open waters where fish yields are low and other fishery development is difficult or impracticable, v) cage fish culture provides accelerating growth in fish production in comparison

with traditional aquaculture, vi) as the technology is very simple it could be easily adapted by poor and landless farmers and vii) harvesting of fish is easy and provides scope for year-round supply of fish to the markets. Therefore, the practice of cage aquaculture to grow fish seed for in situ stocking or to grow them for marketing has definite advantages with respect to technical application and ecological, social and economic performance over conventional system. Cage culture is applicable to all water bodies including non-drainable, non-seinable and flood-prone areas, otherwise not suitable for aquaculture. Even in macrophyte-choked water bodies, a selected area can be cleaned and utilised for cage culture.

Pen culture is very useful to keep the captive stock of fish/prawn in the reservoir. CIFRI has developed a low-cost and simple technology for fish culture in pens erected in reservoir margins. Pen culture is useful in water bodies, where use of fishing gear is difficult. There are three types of rearing done in the pens: i) from fry to fingerlings ii) from fingerlings to table size fishes and iii) from fry larval stages to table size prawn. Except from IMC and Prawn, catfishes and exotic fishes can be grown in the pen. Fishes can be reared even in weed chocked reservoir. Fish in the pens are protected from predators. Pen makes fish growing, easier and bigger by feeding and managing. Advantages of pen and cage culture are already reflected by several workers.

3.55 Varieties of fish seed supplied to the farmer

Fingerling sized fish seeds are always in great demand for any type of aquaculture operations. The report highlights the results of a maiden study undertaken to popularise pond based cage culture for raising fingerling sized fish seed aimed at stocking quality fish fingerlings for augmenting fish production in Meghalaya. A case study was undertaken for raising fry to fingerling sized fish seeds of 3 fish species viz., silver carp (Hypophthalmichthys molitrix), gonius (Labeo gonius) and common carp (Cyprinus carpio) in pond based cages. Fry sized fishes of these species were reared in locally made bamboo-net cages (2 x 1.5 x 2 m) at different stocking densities. The primary objective was to analyse the survival rate and observe the comparative growth rate of different species under varied stocking densities. A total of 18 cages were grouped under 3 stocking densities viz., 150, 250 and 300 fry m-3. Highest survival rate was observed at a stocking density of 150 fry m-3 for all the three species. Among the three species, silver carp demonstrated the highest survival rate at all the

stocking densities. In terms of growth, better performance was observed with stocking density of 250 fry m-3 for all species.

The department distributed fish seeds to beneficiaries under the scheme "Development of Aquaculture 1000 pond scheme" which is being implemented by the Department during 2004-05 onwards. Under the scheme the farmer is entitled for 75% subsidy for both inputs viz. fish seed, etc. and construction of fish ponds. The Government has formulated the scheme in order to popularize fish culture in the state and to further enhance fish production. Distributed fish seeds are Indian Major Carps i.e. Catla catla, Labeo rohita, Cirrhinus mrigala and Exotic carps i.e. grass carp, silver carp and common carp. During the year 2010-11, 18 lakhs seeds were supplied from different farms to the farmers under RKVY scheme.

3.56: Projects undertaken and financial allocations

Table 3.21: Projects undertaken and financial allocations

Year	Name of the project	Sub Sector	Amount (in lakhs.)
2008-09	Up gradation and modernizing of Umsning Fish Seed Farm (Phase1)	Infrastructure	99.00
2009-10	Up gradation and modernizing of Gasuapara Fish Seed Farm (Phase1)	Infrastructure	51.00
	Up gradation and modernizing of Umsning Fish Seed Farm (Phase2)	Infrastructure	100.00
2010-11	11 Coverage of 1000 ponds scheme for aquaculture development	Farmers fish ponds	500.00
	Modernization and up gradation of Mawpun Fish Seed Farm and demonstration centre, Ri Bhoi	Infrastructure	200.00
	Modernization and up gradation of Gasuapara Fish Seed production (Phase2)	Infrastructure	100.00
	Upgradation and modernization of Jamge Regional Seed Production Centre (Phase1)	Infrastructure	100.00
2011-12	Area expansion of individual ponds (Corpus Fund)	Farmer Fish Ponds	733.00
2013-14	Area expansion of individual Ponds	Farmers Fish Ponds	1000.00
	Area expansion of community ponds NMPS		150.00
Total			**3033.00**

During the last five years approximately around Rs. 30.33 Cr. have been released for different projects under RKVY. Out of which an amount of Rs. 23.83 Cr. had utilized for Area Expansion of Individual Ponds and Rs. 6.50 Cr. had utilized for infrastructure development. While evaluating this sector, the field team has found great feedback from the beneficiaries. Out of the total target beneficiaries in this sector approx. 62% beneficiaries rated this scheme highly satisfactory. The details of projects under this are mentioned below:

3.57: Area Expansion of Pond

Table 3.22: Details under Area Expansion of Pond

Year	Activities	District	Area (in ha.)	Expenditure (in lakhs)	Beneficiaries (in nos.)
2010-11	Area expansion under 1000 ponds scheme	7	181	500.00	826
2011-12	Area Expansion individual fish ponds	11	122	733.00	1220
2013-14	Area Expansion under Individual Pond	11	155.70	1000.00	1557
	Area Expansion under Community Ponds (NMPS)	11	49.5	150.00	74
Total			**508.2**	**23.83**	**3677**

Around 3677 number of beneficiaries has been benefitted under the scheme "**Area Expansion of Pond Aquaculture"** and 74 numbers of Community Ponds have been developed under NMPS. The total area covered under the scheme is 508.2 hectares. The total fish production under this scheme is fixed at 2400 Kg/ha. It is expected that an approx. 1194.48 MT of fish will be produced under the scheme and an income of Rs. 1433.40 lakhs will be generated from the sale of those fishes @ Rs. 120/Kg.

During the survey, while interviewing the beneficiaries it was found that under this scheme government has provided them various opportunities. With the help of these the yearly production has increased which contributes toward the family income and improves the financial condition. While interviewing the beneficiaries under "Under area Expansion of Pond Aquaculture" we have found some of the successful case studies under this. One of the farmer in Sohiong block of East

Khasi Hills district informed that earlier he was not satisfied with the income and production of fish farming but after availing the benefit of this scheme the production from his pond is likely to be in the range of 1,000-1,200 Kgs/year. With that kind of production, he will generate an income of around Rs. 1,50,000-1,80,000/-. This will provide for the needs of his family. He practices Integrated Fish Farming and benefits from the Piggery and the Poultry Unit also. He earns Rs. 50,000 - 65,000/- annually from these units. He is now highly satisfied with this.

In the Ri-Bhoi district one more case study was indentified during the visit that one of the farmer in Umling block of Ri-Bhoi got more than 2,000 kg of fish in 2011 and sold them at the rate of Rs. 120/- per kg and received an amount of more than Rs. 2,40,000/-. After that harvest he decided not to allow anglers to fish on his pond as he wanted to concentrate only on harvesting so that he can earn more. From the money he earned, he has been able to pay the salaries of the 2 workers he has employed to work on his ponds by giving them monthly salary of Rs. 6,000/- each. He has also been able to buy the fish feed, etc. Therefore, he is fully satisfied with this scheme.

Fish Pond under "Area Expansion of Pond Aquaculture"

3.58 Impact on production from up gradation and modernization

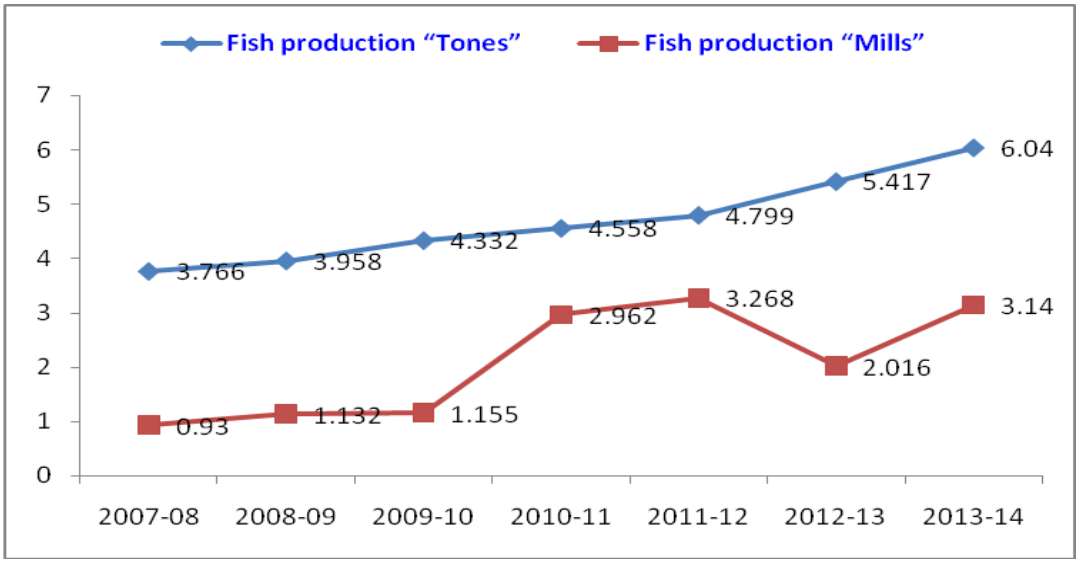
Table 3.23: Impact on production from up gradation and modernization

Sl.No	District	Name of Farm	Area (Ha.)	Production after up- gradation (in lakhs)
1	Ri Bhoi	Umsning	3.67	24
2	East Garo Hills	Jamge	3.48	24
3	South Garo Hills	Gasuapara	1.35	10
4	Ri Bhoi	Mawpun	5.05	10

The different types of technology adopted for up-gradation and modernization of farm are in the form of eco-circular hatcheries.

Table 3.24: overall impact on production from up gradation and modernization

Sl.no.	Year	Fish production "Tones"	Fish production "Mills"
1	2007-08	3.766	0.93
2	2008-09	3.958	1.132
3	2009-10	4.332	1.155
4	2010-11	4.558	2.962
5	2011-12	4.799	3.268
6	2012-13	5.417	2.016
7	2013-14	6.040	3.140



Up-gradation of MSFRTI

Meghalaya State Fisheries Research and Training Institute (MSFRTI) formerly known as Mawpun Research and Training Centre was established in the year 1969 – 70. After the upgradation of the Institute under the Meghalaya State Aquaculture Mission in 2012-13, the Institute has been mandated to:

1. Train and build the skills and knowledge of the Fish Farmers on Pond Management, Hatchery Management, and culture techniques of fish.
2. Serve as a demonstration centre to all fish farmers.
3. To serve as a fish seed Production centre to cater to the growing demand of fish fingerlings in the State.

Mini Mission IV of the Meghalaya State Aquaculture Mission focusses on equipping the fish farmers to help achieve the Mission's objectives with the updated technical Knowledge on Aquaculture. The successful execution of the various components of the Aquaculture Mission will call for systematic building of the competencies of various stakeholders to the required degree. With the inauguration of this Research and Training Institute, on 2nd May 2013, a milestone in the building of the capacities of Fish Farmers of the State has been crossed. The Institute targets to train 80 potential Fish Farmers in a month, with an intake of 40 per batch. In a year 20 Training Programmes will be conducted to cover 800 farmers a year. The number of the farmers will soon increase once the requisite manpower is posted and further expansion of the infrastructure takes place.

The first Batch was given the training from 6th May, 2013 to 10th May, 2013 from Ri Bhoi District with 40 farmers hailing from all three blocks of Umsning, Umling and Jirang. A total of 40 (forty) potential fish farmers attended the training. They hailed from all the three blocks of Umsning, Jirang and Umling Blocks of Ri Bhoi district. Through the pre Training assessment revealed that about 90 % of the Trainees had never received any sort of training on fish culture. All the Trainees expressed confidence to take up aquaculture as a mode of building Livelihoods as the training concluded. The farmers voiced their concerns that the Department should continue to monitor their progress and be in synchrony with their needs. The training also provided a two way learning process where officers were able to learn about the farmers' indigenous technical knowledge on fish culture.

3.59 Feedback, social impact and Success Story of RKVY Scheme under Fisheries Department

1. POND OF SHRI.ECKARSTAR MOMIN-NORTH GARO HILLS

Shri. Eckarstar Momin and his fish pond

Shri.Eckarstar Momin, a fish farmer has set up his fish farming venture in a village called Dilma A'dap, about forty kilometres away from Mendipathar, under Kharkutta C and RD Block, newly created North Garo Hills district. He is also engaged in some local business to meet his day to day need. His fish farming business consists of two components viz: Duck-cum-fish culture and Pig-cum-fish culture.

He is a beneficiary of the Scheme "Aquaculture Development For 1000 Ponds" for the year 2008-2009. He has constructed his pond spreading an area of about 0.3 ha. He also has completed his construction work earlier on his second fishery pond . He had an opportunity to attend several training Programmes organised by the Fishery Department to impart skill, Knowledge, methods/techniques related to fish farming which had helped him to develop the idea of making a decent livelihood out of it.

In the beginning of his first year of fish culture, he has released 3000 nos. of fingerlings. No supplementary feeding was required for his fishery pond as the waste from the livestock acted as feed for fish and manure as well. After one year of stocking he harvested 300 kgs of fish which he sold @ Rs 150/kg generating an income of Rs 45,000/- which he used for his daughter's college admission.

He also mentioned that pond culture has a number of advantages. Pond water not only yields fish but also contribute to irrigation and drinking water for livestock in dry season. He is also rearing 35 nos. of ducks in a duck house constructed over the pond water surface using some wooden or bamboo made poles. It is chiefly for the purpose for selling their meat and eggs.Droppings of ducks are also used to fertilize pond. Ducks are fed with rice bran at the rate of 100gm/day/duck. Each duck lays about 50-60 eggs every year and can be sold at the rate of Rs 10/pair. Approximately, he made a profit of Rs 10,500/- by selling eggs per annum excluding the profit from the meat.

Raising of pigs in a small scale is also a part of his business and a common source of income in many rural areas. He started to work on pig-cum-fish farming with about 4 nos. of pigs that are being raised in his pig sty for the purpose of selling their meat at reasonable prices. He learnt that livestock manure is used to feed the carps. The farmer also has to spend less time and money in buying supplementary feed for the fish. For this reason, he has started his venture of fish farming along with livestocks with determination to get the desired results in near future.

On the other hand, integrated fish farming offers opportunity for taking up various farming activities with optimum utilization of land space for food production, thus increasing household income of small farmers. Inspite of the remoteness of the location, he intends to continue the practice of farming in future and also urges other fellow farmers to adopt this farming system for increasing their income.

"FISH FARMING IS AN ENTERPRISE FOR BRINGING A GOOD SOURCE OF INCOME TO UPLIFT THE ECONOMIC CONDITION OF THE PEOPLE TO SOME EXTENT," he added.

2. Pond of Shri. Hamko Dkhar, Sohkyrda, Pynursla Block, East Khasi Hills

Smti. Hamko Dkhar residing at Urksew,Pynursla Development Block. She is a beneficiary of the Area Expansion of Pond Aquaculture under Value Chain Management. The project is located at Urksew in Pynursla and it is about 50 Km from the Headquarter (Shillong). The Project is constructed by means of excavation covering a water area of 0.2 ha with a minimum depth of 2 meters in which 2000 nos. of fish seeds (fingerling size) comprising of IMC and exotic species were stocked and it is expected that about 500-550 kg of fish will be harvested from the project at the end of every year of culture period. Shri Hamko is a progressive fish farmer with a well maintenance of her pond. It is mentioned that the farmer will contribute towards her family income after harvesting of fish. She has also motivated and inspired other fish farmers to take up fish farming

The production is approximately 500 Kg of fishes at the end of 1(one) year harvesting culture. The income generated out of this project is approximately Rs.75, 000/- (rupees seventy five thousand), at the rate of Rs. 150/Kg. The rate can even goes up, upto Rs200-220/Kg but this depends upon the market.

3. POND OF SMT. MEGHALINE MARAK-NORTH GARO HILLS

Smt.Meghaline Marak, hails from a village called Gokolgre, which is located about seven kilometres from Bajengdoba, under Resubelpara C & RD Block and within the newly created North Garo Hills, district. Today, she makes her livelihood by selling fish in Gokolgre market. Fish Farming not only helps in uplifting economic status but also add aesthetic value to the village. After the sudden death of her father the whole family was badly affected due to poverty and she had a responsibility to look after her mother and two brothers. Despite the hurdles ahead of her, she had never lost hope and begun engaging herself in some local business in order to support her family. She owned a small

parcel of land measuring about 0.6 ha of paddy field and a fish pond of 0.1 ha constructed by her father prior to his death. But for want of finances, the construction was left incomplete.

She had the passion for fish farming and approached the Fisheries Department for support. She was sent for a training programme on fish farming which strengthened her knowledge and made her gain more interest on fish farming. With the help of the Fishery Department she extended her fishery pond from 0.1 to 0.32 ha. under the scheme "Aquaculture Development for 1000 ponds" in the year 2008-2009. She repaid the credit component of 25% a year after.

"Training is necessary for a farmer because without proper training we will not know the methods/techniques that have to be applied for the culture of fish. Adopting new techniques has helped lift me out of poverty and now I have enough to eat, enough to give to people around me and also to sell in the market,"she added. The income generated in the earlier days through agriculture was only Rs 40,000/- per year which was not sufficient even to meet the needs of the family but fisheries has added to that income and today I do not regard myself as poor", she added. She also mentioned that Training Programmes given by the Fishery Department empowered the poor fish farmers with up-to-date knowledge and information about fish culture including best practices, consumer preferences, sources of finance, etc. Besides fish farming, she also carried out agricultural practices for domestic consumption.

With earning received from the sale of fish she purchased a Rice Mill and now has dreams. "GROWING FISH IS THE EASIEST WAY OF EARNING A BETTER LIVELIHOOD", she said.

4. Pond of Shri. Rajan Thabah , Nongmadan, Pynursla Block, East Khasi Hills

Shri. Rajan Thabah residing at Nongmadan Village,Pynursla Development Block. He is a beneficiary of the Area Expansion of Pond Aquaculture under SPA-I. The project is located at Nongmadan about 2 Km from Pynursla and it is about 51 Km from Headquarter (Shillong). The Project is constructed by means of excavation covering a water area of 0.2 ha with a minimum depth of 2 metres in which 2000 nos. of fish seeds (fingerling size) comprising of IMC and exotic species were stocked and it was expected that about 500-550 kg of fish will be harvested from the project at the end of every year of culture period.

The production is approximately 500 Kg of fishes at the end of 1(one) year harvesting culture. The income generated out of this project is approximately Rs.75, 000/- (rupees seventy five thousand), at the rate of Rs. 150/Kg. The rate can even goes up, upto Rs200-220/Kg but this depends upon the market.

Shri. Rajan Thabah is a progressive fish farmer with a well maintenance of his pond. It is mentioned that the farmer will contribute towards his family income after harvesting of fish. He has also motivated and inspired other fish farmers to take up fish farming. Nongmadan village is 51 kms from Headquarter (Shillong).

5. Pond of Shri. Restonath Hynniewta, Khliehshnong Sohra, Wahumsaw, Shella Bholaganj Block, East Khasi Hills

The Fishery Project of Shri Restonath Hynniewta at Khliehshnong Sohra Village located at Umsaw under Shella Bholaganj C & RD Block East Khasi Hills. The project has been completed on November 2011 covering Water Area 0.2 ha with a minimum depth of 1.5 m in which 2000 Nos. Of Fishseed

(Fingerling Size) comprising of Indian Major Carp (I.M.C) and other Exotic species stocked and the annual production is about 600 Kg (approx) of fish from the project every year.

Moreover, besides fish culture the farmer also conduct integrated farming such as poultry, cattle farming,etc, there has been a lot of income generation from all the allied activities practices by him that inspires others fish farmers to take the example of his collective efforts in contribution to what he had received even though a small financial assistance from the Fishery Department. A number of times the trainee from Meghalaya State Fishery Research Training Institute (MSFRTI) had visited the Fishery pond of Shri. Restonath Hynniewta where thoughtful expression had been given by him related to the success in the Fish culture and the concept of integrated farming.

6. Pond of Shri. Paila Kharkongor, Nongthymmai, Khad Ar Shnong Laitkrioh Block, Sohra Sub-Block, East Khasi Hills

Nongthymmai Laitkroh is a small village about 35 Km from Sohra which fall under Khad Ar Shnong Laitkrioh C & RD Block of Sohra Sub Division, Sohra. While conducting the inland water survey, it is found that the region is suitable for implementing a fishery project. The project has been completed on September 2010 covering Water Area 0.20 ha with a minimum depth of 1.5 m in which 2000 Nos. Of Fishseed (Fingerling Size) comprising of Indian Major Carp (I.M.C) and other Exotic species stocked and it is expected about 620 Kg of fish will be harvest from the project at the end of one year culture. Shri. Paila Kharkongor in a small way started taken up fish farming through

his own effort during 2007-08 and later was assisted by the Department under the Scheme "One thousand ponds" during 2008-09. The annual fish production from his project is about 600-650 kg/year. The fishes produced are being sold locally and in the nearby market. With the sincerity and hard work of the beneficiary through fish farming this has contributed tremendously towards the family income, improved the economic condition of the family and motivated others fish farmers of the District to take-up fish farming

7. Pond of Shri Charles Slong, Pdengshakap - West Jaintia Hills District

Shri Charles Slong, a senior citizen, is the proud owner of a fishery pond located at Pdengshakap village covering an area of 0.25 hectare under the Amlarem Sub-Division, West Jaintia Hills District. The village is about 50 kilometres from Jowai. The pond is located in very ideal climatic conditions with very good rainfall and is highly suitable for fish farming. The growth rate of fish in this area is higher than in other parts of West Jaintia Hills District. Shri Slong started his project in 2004 bearing initial expenses himself. His dedication to fish farming though remarkable, was still not remunerative. As he was not satisfied with the incomes, he decided to avail technical and financial assistance from the Department. He was assisted under the 1000 Ponds Scheme during the year 2010-11.

He stocked 2,500 fingerlings in his pond in June 2012. The production from his pond is likely to be in the range of 1,000-1,200 Kgs/year. With that kind of production, he will generate an income of around Rs. 1,50,000 - 1,80,000/-. This will provide for the needs of his family especially since his daughter is now pursuing her higher studies in Pune. He practices Integrated Fish Farming and benefits from the Piggery and the Poultry Unit also. He earns Rs. 50,000 - 65,000/- annually from these units.

Shri Charles Slong is a role model to the people in Pdengshakap village to take up fish farming for improving the economic status of the family. A good number of beneficiaries have benefitted under the Special Plan Assistance (SPA) 2010-11 as a part of the Meghalaya Aquaculture Mission. This entrepreneur has worked very hard to achieve success and is an inspiration to the people of the State of Meghalaya.

8. Pond of Smti. Dayanti Bthuh, Hawai Sutnga - West Jaintia Hills District

The Fishery Project of Smti. Dayanti Bthuh is located at Hawai Sutnga about 110 Kilometres from Jowai. This Project was assisted by the Department of Fisheries under the Area Expansion of Pond Aquaculture under RKVY 2010-2011. This farmer was practising fish farming since 2005. As she was unfamiliar with the modern techniques adopted and new technology utilised, the production from her 0.2 hectare pond was unsatisfactory. But the odds were with her when she saw an advertisement in the local newspaper that the Department of Fisheries was calling for applicants to avail technical and financial assistance under the scheme "Area Expansion of Pond Aquaculture under RKVY 2010-2011". This provision from the Department provided an opportunity for her to increase the water area of her project. With the advice from the officers of the Department she was able to re-design the inlet-outlet system of the pond by installing A.C/G.I pipes and attaching appropriate meshed-size steel nets in these pipes, thus maintaining a clean and fresh water supply to the pond. Under the Scheme, she received training on Fish Farming Practices. With the now acquired knowledge, she is now following all the modern techniques and adopting new technology. She is very pleased with the help she received from the field staff and officers of the Department.

It is expected that the production may be in the range of 550Kg/year - 600Kg/year. Her total income would be to about Rs. 90,000/- which is a reasonable income for the farmer. As she practices

Integrated Fish Farming, she also generates around Rs. 30,000-40,000/- income from the sale of Pigs. This has improved the financial status of her family.

Smti. Dayanti Bthuh has proven to be a very bright person, very quick in learning and is very keen to further improve her project. She has not only upgraded her pond to a new level, but she was able to generate employment to the people because she can now afford to spend some of her income to engage manual labour. It is Entrepreneurs like her with help of the Officers and technical staff of the Department that can guarantee the Success of the Meghalaya State Aquaculture Mission (MSAM) 2012-17.

3.60 SWOT Analysis of the RKVY Scheme under Fisheries Department

Strength

- Vast fisheries resources in Meghalaya
- Source of livelihood
- Contribution of nearly 0.8% GDP and 4.45 Agriculture GDP
- Potential source of food and nutritional security
- Tool for poverty alleviation and women empowerment
- Contributing about 17% of national agriculture export

Weakness

- Yield gap in fisheries resources particular in reservoir fisheries. Yield reduce to 1000 kg/ha where as potential in 3.4 thousand kg/ha.
- Low value addition and fish processing. There are no organized and coherent efforts to formulate and implement policies for the processed fish/fishing product for domestic market.

Opportunity

- Fisheries and aquaculture provides for diversification as well as value addition in farming practices. Due to value addition, fish farmers and fisherman across the Meghalaya will receive remunerative prices for the production.
- In case of aquaculture, scope exits for bringing more fish species with a focus on food fish, ornamental species and there with potential for sport and tourism.

- Grooming demand for domestic fresh water fish about 35% of Indian population is fish eater and the per capita consumption is 9.8 kg where as the recommended intake is 13 kg.
- Fish production can be enhanced in rain fed water bodies by 2 to 4 time – use of MGNREGA

Threats

- Climate change and other factor are leading to decrease production
- Quality of fish seed is the most important problem and there is no organized brood stock production activity
- No indigenously commercial fish mills
- Lack of infrastructure and skilled manpower in decrease diagnostics labs

3.61 Major finding and Recommendations

The study showed that the states have moved towards intensive fisheries. There still exist numerous constraints for further growth in this sector. The three main constraints faced by the fish farmers were poaching, water availability and credit. The risks associated with these problems act as an entry barrier. This has prompted the entry of smart breed of entrepreneurs who are able to protect their fishing rights effectively and also bring with them the much needed credit to intensify effort of fishing. Thus the profile of a fisherman has changed considerably with the new entrants coming from all walks of life encouraged by the opportunity of better livelihoods. These entrepreneurs usually were the influential people who were able to build social contacts to counter the opposition from villagers to fish in these ponds and prevent poaching with a strong hand. With the banks unable to provide credit due to the insecure property rights on the fishing ponds, moneylenders and middlemen are taking their place.

There was a need for creation of more fisheries harbours and landing centers. Similarly, up-gradation and renovation of existing harbours and landing centres and creation of good post harvest facilities with a view to meet global export standards were also impressed upon by the states. Availability of good quality seed was a matter of concern which everyone which was shared by everyone.

There is need to support both financially and technically the efforts for setting up as many hatcheries and nurseries as are required. This would include renovation and revival of existing hatcheries. However, mere construction of hatcheries does not guarantee quality, and therefore seed certification was essential. Capacity building is an important area and support for training programme for fisheries professional, farmers and entrepreneurs was needed.

While the allocation of RKVY funds to the fisheries sector has not been adequate in most cases, it is necessary that viable fisheries projects are designed in order to access RKVY funds. There was an urgent need to establish clean and hygienic domestic markets; at least one in each district to popularize the concept of clean markets and to promote domestic consumption.

Cooperative Department

The department works for the development of Co-operatives in the state. The **Cooperative movement** is rooted in people's organization based on 7 (seven) basic principles, these are follows:

Sl.no.	Basic Principle	Aspects
1	Voluntary and open membership	Cooperative are voluntary organisations, open to all person able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political discrimination.
2	Democratic Member Control	➢ Cooperatives are democratic organisations controlled by their members, who actively participate in setting their policies and making decisions. ➢ In primary cooperatives members have equal voting right (one member, one vote).
3	Member Economic Participation	Members contribute equitability to the capital of the Cooperative Society. Members usually receive limited compensations, if any, on capital subscribed as a condition of membership. Member allocate surplus for developing their cooperative, possibly by providing reserves, benefiting members in proportion to their transaction with the cooperative and supporting other activities.
4	Autonomy and Independence	Cooperatives are autonomous, self-help organisations controlled by their members, if they enter into agreements with other organisations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy.
5	Education, Training and Information	Cooperatives provide cooperative education and training for their members, elected representatives, managers, and employees to enhance development of their cooperatives. They inform the general public – particularly young people and opinion leaders – about the nature and benefits of cooperation.
6	Cooperation and Cooperatives	Cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional and international structures.
7	Concern for Community	Cooperative work for the sustainable development of their communities through policies approved by their members.

Cooperatives are autonomous associations of persons united voluntarily to meet their common, economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. They imbibe the values of self help, self responsibility, democracy, equality, equity and solidarity.

Due to the misuse and abuse of agency system for rural credit by landlords, money lenders, *zamindars* during British Rule in India, there were great consternation and revolt by farmers in some parts of India. This led to search for some reform models. The first Cooperative Society Act of 1904 was enacted to enable formation of "agricultural credit cooperatives". The 1904 Cooperative Societies Act was later repealed by 1912 Cooperative Societies Act which provided for formation of Cooperative societies other than credit. In 1919 there was Administrative Reforms and Cooperatives were made a provincial subject making each province responsible for Cooperative movement and development. In 1942, the Multi-Unit Cooperative Societies Act, 1942 was enacted by the Government of India with an object to cover societies whose operations are extended to more than one state. Later, in 1984, the Government of India enacted a comprehensive Act known as Multi State Cooperative Societies Act, 1984, which also repealed the Act of 1942. On the recommendation of the Mirdha Committee and the "Model Cooperative Societies Act" the Government of India enacted the Multi State Cooperative Societies Act, 2002 which provided for democratic and autonomous working of the Cooperatives. The Multi State Cooperative Societies Act, 2002 came into force with effect from August 19, 2002.

After independence Assam passed its own cooperative act namely the Assam Cooperative Societies Act, 1950. With the coming into being as an Autonomous State on 2nd April 1970, Meghalaya inherited 472 Credit Co-operative societies. In 1976 Meghalaya adopted the legacy Assam Act. The office of the ARCS was established in Shillong in 1948. Cooperative was organized in Tura for Consumer Goods during Second World War. During 1971-72, there were a total of 953 Cooperative societies in Meghalaya with a total membership of 57 thousand, Rs. 32 Lakhs of share capital and 133 Lakhs of working capital. Historically the societies were not in good health due to poor management, lack of supervision, absence of full time trained secretaries, absence of linkage of credit with marketing, low yield from traditional method of cultivation, absence of marketing facilities of farm produce and lack of co-operative education and vested interest etc.

A master plan was formulated by the Reserve bank of India in 1974 in consultation with the Registrar of Co-operative Societies and Meghalaya Co-operative Apex Bank for re-organization and revitalization of base level primary co-operatives, which resulted in the emergence of 180 re-organized Service Cooperative Societies (popularly known as PACs) in the whole State of Meghalaya. All the re-organized Service Co-operative Societies were having full time paid secretaries and they were designed for multipurpose activities, such as dispensation of credit, distribution of fertilizer, improved seeds and other inputs, supply of consumer goods, marketing of surplus agricultural products etc and are for the purpose of rural credit termed as PACS (Primary Agricultural Credit Societies).

Besides the above, the State of Meghalaya has many other types of Co-operative societies like Housing, Handloom, Industrial, Fisheries, Consumers, Labour Contract, Transport Poultry, Women, Joint Farming, Processing, Dairy, Piggery and other type of co-operative societies. These societies are functioning and working according to the aims and objectives provided in their by-laws and in accordance with the State Co-operative Act and Rules.

3.62 Cooperative Societies assisted under RKVY

Under Rahstriya Krishi Vikas Yojana (RKVY) Cooperative department have provided support to 19 Diary and Livestock Societies in the state at an estimated budget of Rs. 100.00 (in lakhs). The support was provided during the year 2011. The details pertaining to the benefits derived and details pertaining to the cooperative societies are as follows:

Table 3.25: Cooperative societies assisted under RKVY

(Rs. In Lakhs)

Sl. No.	Name of the beneficiary	Location	Amount sanctioned	Amount released	Scheme /activity created	Nos. of beneficiary	
						Male	Female
1	Progressive Primary MPCS Ltd.	Nongpoh (Ri Bhoi)	15.00	15.00	Integrated poultry development	21	10
2	Lailad Multipurpose C.S. Ltd.	Lailad (Ri Bhoi)	1.00	1.00	Fish development	20	6
3	Kyrdem Kulai Livestock &Allied C.S. Ltd.	Kyrdem Kulai (Ri Bhoi)	5.00	5.00	Procurement &distribution of milk	15	7
4	Rongpharkong Multipurpose C.S. Ltd.	Rongpharkong (Ri Bhoi)	1.00	1.00	Procurement &distribution of milk	11	4
5	Nongthymmai Planters Multipurpose C.S. Ltd.	Nongthymmai (Ri Bhoi)	1.00	1.00	Broiler rearing	30	25
6	Kudengrim Fishery C.S. Ltd.	Kudengrim (Jaintia Hills)	5.50	5.50	Construction of fish pond	28	7
7	Namrhenlang Multipurpose C.S. Ltd.	Namrhenlang (Jaintia Hills)	5.00	5.00	Purchase of 5 milch cows	60	23
8	Kyrwen Primary Milk Producers' C.S. Ltd.	Kyrwen (Jaintia Hills)	5.00	5.00	Purchase of 5 milch cows	15	7
9	Lumkyndong Primary Milk Producers' C.S. Ltd.	Lumkyndong (Jaintia Hills)	3.00	3.00	Purchase of 3 milch cows	10	5
10	Mendipathar Multipurpose C.S. Ltd.	Mendipathar (East Garo Hills)	15.00	15.00	Poultry farming & dairy/ milk production centre	84	170
11	Nongstoin Poultry Producers' C.S. Ltd.	Nongstoin (West Khasi Hills)	2.50	2.50	Poultry farming	31	15
12	Mawteibah Multipurpose C.S. Ltd.	Mawteibah (East Khasi Hills)	1.00	1.00	Piggery breeding	10	5
13	Banroi Multipurpose C.S. Ltd.	Banroi	1.00	1.00	Construction of fish pond	18	10
14	Janiaw Multipurpose C.S. Ltd.	Janiaw (East Khasi Hills)	8.00	8.00	Construction of cattle shed & purchase of 4 milch cows	13	3

Sl. No.	Name of the beneficiary	Location	Amount sanctioned	Amount released	Scheme /activity created	Nos. of beneficiary	
						Male	Female
15	Galaxy Multipurpose C.S. Ltd.	Sheila Bholaganj (East Khasi Hills)	5.00	5.00	Piggery breeding unit	48	24
16	Umlyngka Dairy Milk Producers' C.S. Ltd	Umlyngka (East Khasi Hills)	6.00	6.00	Purchase of 6 milch cows & deep freezer	64	4
17	Mawklot Milk Producers'C.S. Ltd.	Mawklot (East Khasi Hills)	2.00	2.00	Purchase of 3 milch cows/equipment & appliances	14	10
18	Wahkdait Pashum Ropeway Transport'Fruit Processing & Livestock C.S. Ltd.	Pashum (East Khasi Hills)	15.00	15.00	Construction of 3 fish ponds/piggery breeding and poultry farming	31	10
19	Kodaldhowa Maspala Fishery C.S. Ltd.	Kodaldhowa Maspala (West Garo Hills)	3.00	3.00	Fish rearing	52	11

In order to undertake certain group based activities, farmers' cooperatives/self help groups were constituted. These groups were mainly involved in creation of savings habit among the farmers and lending to them at the lower rate of interest. Under RKVY, seed money was given to this farmers' group to make them functional. However, only 0.2 per cent of the sample farmer was found to be the members of such groups as the number of farmers' groups formed was limited and they were geographically widespread. There seems to be a positive impact of group activities on income earned by the farmer households.

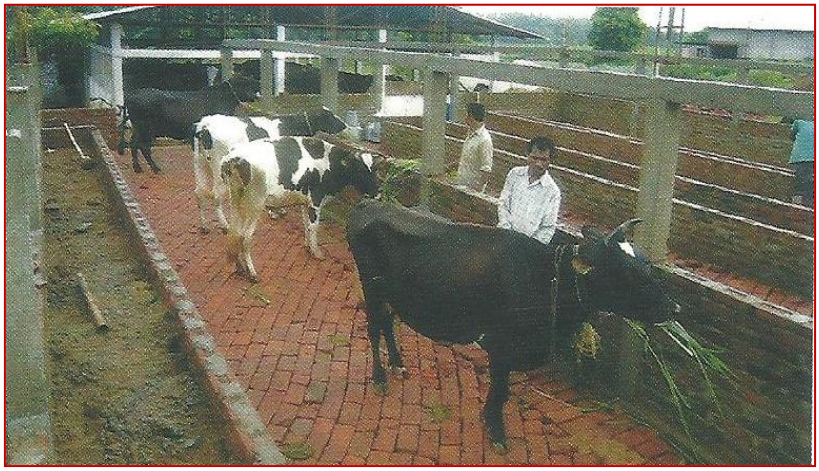
3.63 Impact of RKVY Scheme on Cooperative Societies

A Co-operative is a unique form of business used by people and businesses for their mutual benefit. Cooperatives are community-based, rooted in democracy, flexible, and have participatory involvement, which makes them well suited for economic development. An economy based on one form of business organization alone is neither desirable nor possible in modern times. To justify their existence and fulfill their purpose, cooperatives must make a significant and unique contribution to solving some of the massive problems facing mankind today. This paper examines the role of cooperative societies in economic development. The aim is to investigate the ways in which cooperatives can act as agents towards sustainable community development.

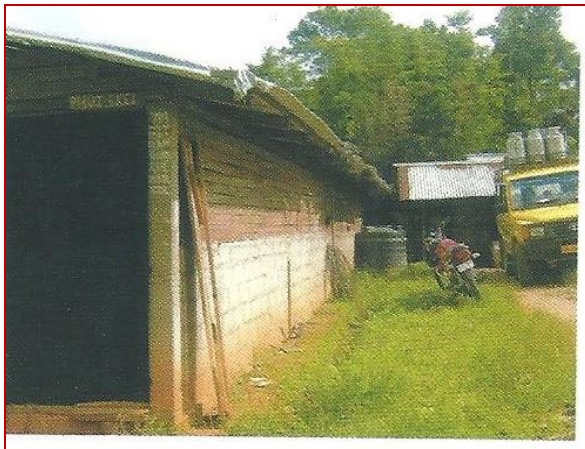
Cooperative is a common place for the people, who deliver milk in the morning and evening, the people interact even on a new thing, introduce its communication and thus it is being spread within

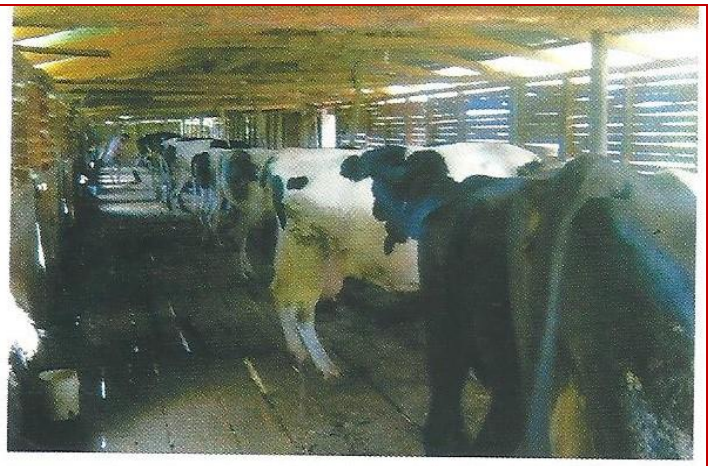
a short time through it may or may not be adopted in the society. Similarly, if events held at any household, he/she is helped by financially and socially. All the sampled beneficiaries have also agreed that Socio-economic impact of dairy and poultry cooperative is significantly positive. Cooperatives societies have made the farmers to unite in a group, which has made them more social. He/she adds that income from the milk and livestock farming has made them culturally changed such as with good housing, hygienic toilet, bio-plant, television and education.

Sl.no.	Name of the Society	Location	Impact
6	Progressive primary cooperative Society	Nongpoh (Ri Bhoi)	With RKVY assistance, the Cooperative Society has expanded its business to Poultry farming and taken up integrated Poultry farming and stated production of Poultry feed at its own feed mill for own farm consumption and setting up of a Hatchery unit for production of Chicks at Amjok, Byrnihat, 20 Km from Nongpoh District headquarter. With increase in business, inculcated saving and thrift habit among the farmers.
7	Mendhipathar Multipurpose Cooperative Society	Mendhipathar (East Garo Hills)	Access to availability of milk, eggs, meat and vegitables helped to improve nutrition among the poor and marginal farmers, The marginal farmers are motivated to rear livestock from the RKVY experience and many of them have improve their livelihood means, Availability of organic vegetables and paddy. Improved living conditions with RKVY assistance inculcated saving and thrift habit among the farmers. Distribution of chicks and Piglets for the marginal farmers at reasonable price Availability of organic manures for farming, production of biogas, hence saving the tress falling for firewood.
8	Umlyngka Dairy Milk Producer cooperative Society	Umlyngka (East Khasi Hills)	RKVY assistance enabled the Cooperative Society to increase the production of milk from 23 liters during inception for a few Nos. of Cows to 3800 liters a day for 1300 Nos. of Cows. The cooperative purchases milk @Rs. 41.25p from farmers numbering 103 Nos. and sell to the Mawiong Milk Procurement and Marketing Agency, Shillong @Rs. 42.00p and local market improved household's income through the sales of milk, milk product, chicks, eggs, etc. Under RKVY scheme assistance, the cooperative was able to pay of all dues and paid of all loans.

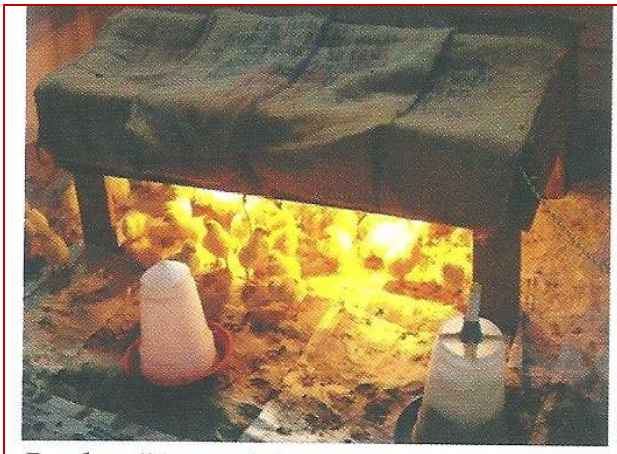


Diary unit under RKVY of the Mendipathar Multi-purpose Cooperative Society, Mendipathar, East Garo Hills





Diary units of Kyrwon Milk Producer Cooperatives under RKVY in Jaintia Hills District



Poultry Units of the Nongstoin Poultry Producers Cooperative Society, West Khasi Hills under RKVY

Diary Cooling Units of theUmlyngka Primary Milk Producers Cooperative, East Khasi Hills under RKVY

3.64 Success story RKVY Scheme on Cooperative Societies

Kyrwen Primary Milk Producers' Cooperative Society

Name	**:**	**Kyrwen Primary Milk Producers' Cum Agro Livestock Cooperative Society Ltd. Kyrwen, Mookaiaw, West Jaintia Hills**
Year of Formation	**:**	**2006**
Membership	**:**	**Male – 6 Female – 9 Total – 15**
Chairman	**:**	**Shri. A. Lapasam**
Secretary	**:**	**Smt. D. Lyngdoh**
Total Share Capital	**:**	**Rs. 2,92,500**
Business Turnover	**:**	**Rs. 14,18,257**
Working Result	**:**	**Rs. 2,10,416**

The Kyrwen Primary Milk Producers' Cooperative Society is a group of farmers who organised themselves into a co-operative to collaboratively raise the socio-economic status of its members. The co-operative is located at Kyrwen village, 50 kms from Jowai, under the Dolloiship of Elaka Raliang of West Jaintia Hills District; it consists of six men and nine women members. The village is well connected by road, and transport plies regularly.

Bah A. Lapasam, the co-operative's Chairperson ushered in the vision of a co-operative when he began a dairy farm at Jowai, where he found little support. Moving to Kyrwen, his ancestral village, he rallied the other farmers, steering their vision towards co-operative efforts in dairy farming. The

initial years were trying, but in 2006, the Kyrwen Primary Milk Producers' cum Agro Livestock Cooperative Society was formed and registered. The cooperative rears milch cows, and grows fodder and other cereals for better livestock feed. They began with five milch cows and a temporary loan. With financial assistance from the State Government, the co-operative bought more milch cows and constructed a larger cowshed. Through the RKVY Scheme from the Central Government, they further expanded their business. They now have thirty six milch cows that produce 200 to 300 litres of milk a day. This milk is supplied to the Dairy Plant at Jowai, as well as to local consumers. The co-operative has also served the purpose of the Veterinary Department; they are the largest supplier of milk to the Chilling Plant at Jowai.

They have seven paid employees who are either skilled or unskilled farmers. The cooperative's welfare practices include lending support to member farmers in cash and in kind, especially in the in the event of sickness or misfortune. At any death, Rs. 5000/- is given to the bereaved family as support.

Nongstoin Poultry Producer Cooperative Society

Name	**:**	**Nongstoin Poultry Producers Cooperative Society Ltd. Pyndengrei, Nongstoin, West Khasi Hills**
Year of Formation	**:**	**1978**
Members	**:**	**Male – 22 Female – 24 Total – 46**
Chairman	**:**	**Smt. W. Pariong**
Secretary	**:**	**Smt. G. Iawphniaw**
Total Share Capital	**:**	**Rs. 6,55,790**
Business Turnover	**:**	**Rs. 7,27,526**
Working Result	**:**	**Rs. 36,748**

The Nongstoin Poultry Producer Cooperative Society in West Khasi Hills was registered in 1978 by individuals who came together to cooperatively rear and breed poultry as a means of livelihood. For a number of years, the cooperative reared poultry of only local breed, underequipped as they were to handle the more elaborate and scientific methods of rearing the broiler variety of poultry.

In 2001, with training, and increased availability of funds, they felt better equipped to embark on poultry farming with broiler and curoiler birds. The demand for poultry increased, and with it , the volume of business. They also plan to experiment with rearing layers in the near future. In 2004, they received assistance through the Integrated Co-operative Development Project, which encouraged them to train further in poultry farming. This persuaded them to expand fulltime into poultry farming, In 2009, they received assistance from the Rashtriya Krishi Vikas Yojana (RKVY), a flagship programme of the Department of Agriculture.

The co-operative is located in Pyndengrei, Nongstoin, with access to the marketplace, where poultry feed and other inputs for business are easily available. This makes their business especially viable. They are the only co-operative in the area to have taken up poultry farming on a significant scale. The co-operative also trains other interested individuals in the skills of poultry farming. Every

general meeting includes a session on the current economic viability of the poultry trade. All members receive dividends out of profits earned. Nongstoin Poultry Producer Cooperative Society

The co-operative owns 1,500 square feet of land, where they go about their poultry farming business. The farm site is motorable, with water source close by. There are currently two women who are full time paid employees of the co-operative. An extension coop is under construction, and on completion, another two trained workers are likely to be employed.

Progressive Primary Multipurpose Cooperative Society (MUCOOP)

Name	**:**	**Progressive Primary Multipurpose Cooperative Society Ltd. Byrnihat, Ri Bhoi**
Year of Formation	**:**	**1992**
Membership	**:**	**Male – 24 Female – 9 Total – 33**
Chairman	**:**	**Shri. L.M. Syiem**
Secretary	**:**	**Shri. D. Singh**
Total Share Capital	**:**	**Rs. 27,47,500**
Business Turnover	**:**	**Rs. 6,82,06,415**

The Progressive Primary Multipurpose Cooperative Society (MUCOOP) was officially registered with the SubRegistrar of Cooperative Societies, Ri-Bhoi SubDivision Nongpoh, in January 1992, with the aim of promoting and developing the economic and cultural interests of the area while encouraging thrift, cooperation, self-help and mutual assistance.

Being a Registered Government Supplier, it caters to all kinds of office stationery, Information Technology machines and accessories ranging from Photocopy Machines, Desktop PCs and other related peripherals within the State. The co-operative's electronic segment comprises different national business partners such as HP, Godrej, Boyce, Xerox and others. The co-operative provides after- sale services on IT products, ensuring that clients stay satisfied.

They have further diversified into Poultry farming supplies. The co-operative is the authorized distributor of Amrit Feeds in Meghalaya, aimed to cater the needs of local farmers/growers in the region. The co-operative, through its different outlets provide the sale of day-old chicks, feed, equipment and medicine for commercial broiler chicken farms in Ri Bhoi, East Khasi Hills and Jaintia Hills Districts.

The co-operative has started micro-financing Poultry farmers in Ri-Bhoi District. As part of its endeavour to contribute to the growth of the community, they recently started the Integrated Farming Project to encourage local farmers. The farmers were provided with sufficient supply of feed, vaccines, technical support and an agreement on profit share percentage. To facilitate this, the co-operative has set up offices strategically at Umsning , Nongpoh and Umroi. From these, there are about thirty-five beneficiaries.

Through its Farmer's Development Programme, the co-operative organized a one day training workshop programme at Umsning by involving officers and experts of different Line-Departments. In addition, the co-operative has also organized a health camp at Khlieh Umtrew. The co-operative is also the authorised dealer for fresh chilled chicken items from Amrit Hatcheries' brand of Fresco Pollo.

3.65 SWOT Analysis of Cooperative Societies

I STRENGTH

- Improved household's incomes through the sales of milk, milk products, chick, eggs, etc.
- Enhanced access to market information through their societies, mobile phones, information posters and meetings.
- Enhance market information systems among dairy farmers; enhance networks among dairy farmers both within and outside the country.
- Members housing conditions improved and greater employment.

II WEAKNESS

- Inadequate training of members, Staff and ordinary members.
- Lack of appropriate technology in processing, transportation storage and packaging, and no formal contract with agents and distributors.
- Lack of sufficient capital, which could enable to purchase modern machine for cheese processing, and modern machine for sealing milk in its containers.
- The use of an un-refrigerated ordinary van has been found to be unhygienic.

III OPPORTUNITES

1. PROFESSIONAL MANAGEMENT:

Human Resource Development is needed to meet the challenges before cooperatives. The need for improving professional competence of the employees of the cooperatives has been stressed. The cooperatives can appoint persons with professional skill for the efficient management of cooperatives. We have got a network of Cooperative Training Institutions, which can fulfill the needs of cooperatives.

2. DIVERSIFICATION OF ACTIVITIES

The cooperatives can diversify their activities, their products and the services. Already the Agriculture and Rural Development Banks started lending for Non-Farm Sector activities. Similarly, the marketing cooperatives and consumer cooperatives may expand their processing activities. Diversification of activities helps for survival and growth.

3. EXPANSION OF BUSINESS:

Under the free market economy, the agricultural produce, manufactured goods and processed food can be sent to any country with limited import duty. The agricultural cooperatives can exploit this opportunity for exporting fruits, pulses, spices etc, in a larger scale. The weavers cooperatives can make use of this opportunity for exporting their products.

IV THREATS

1. COMPETITION

Cooperatives face tough competition from the private sector. The farming community and agro based industrial units may face stiff competition in the sale of their products. The private sector banks provide better service than the service provided by cooperative barks. The cooperatives are not able to meet the expected standards and quality of products and services.

2. DISLOYALTY OF MEMBERS:

The success of cooperatives depends upon the loyalty of their members. Now a days the members are not loyal to their organisation. They do not respect their agreements. In credit cooperatives, members do not repay their loans promptly and due to this attitude the amounts of Non-Performing Assets are increasing. This makes the credit institutions ineligible to finance.

CONCLUSION

Cooperative movement is playing a significant role in the economy of our country by giving great strength to the economic progress. The Governments, both central and states, shall continue to help the cooperatives, but they shall not interfere in the functions of cooperative. Restrictive provisions in the existing cooperative laws must be eliminated by making amendments in the lines of the State Cooperatives Societies Act or the Multi - State Cooperative Societies Act, 2002. This will pave the way for the development of true cooperatives.

3.66 Suggestions and Recommendations

- Cooperative societies need the freedom for Associations to make decisions at the member's level.

- Develop cooperative actions at village level to empower farmers to seek other opportunities to address risks, gain access to financial services, encounter more economic opportunities and improve the democratization processes.
- Help the system that delivers and disseminates information to Cooperative societies to improve their functionality.
- Women and youths participation in cooperatives should be encouraged and enhanced.
- More professional management of cooperative businesses is needed (human capital in cooperative management) at all levels.
- Financial services should be in close proximity and easily available of members and the cooperatives.

Chapter – 4

Conclusion and Recommendation

Public investment plays a great role in achieving a desirable growth rate through improvement in crop productivity, market infrastructure, soil health and extension support services. RKVY is an important programme initiated by the Government of India, which encourages the state governments to increase public investment in agriculture and allied sectors. RKVY has focused on 21 major areas within agriculture and allied sector with a view to bring about a holistic development of the sector. The programme has been designed so meticulously that interventions in these focus areas benefit not only the landed farmers in rural areas but also agricultural labourers who generally engage in livestock rearing for supplementing their household income. It is interesting to note that all the major focus areas encompass infrastructure development as an important component of the programme. The infrastructure component has been included in most of the sector/area specific projects irrespective of its target group, i.e. farmer beneficiary or institutions. The inclusion of the infrastructure components among the sector specific projects has created tangible assets to be utilised for improving the productivity growth in agricultural sector.

RKVY provides flexibility in funding the projects particularly innovative and infrastructure oriented projects with a strong emphasis on increasing state budgetary allocation for agriculture and allied sectors for availing of funding under the programme. Although RKVY is a state plan scheme, central government provides 100 percent grant for executing the projects/schemes proposed under this programme. The District Agricultural Plan and State Agricultural Plan provide thrust areas for designing of schemes and financial resources required for proper implementation. The projects focusing on creation of infrastructure and assets have been designed and implemented by various institutions in the states. Generally, infrastructure projects have a relatively long duration and more amount allocated as compared to the normal projects. Therefore, these infrastructure oriented projects under RKVY have been largely implemented by the line departments of agriculture, Agricultural Universities, government owned autonomous corporations, bodies and cooperative organisations.

It can be observed that the expected output and outcomes seem to have been achieved across projects implemented under different sectors. Achievement of outputs can be seen in terms of creation of assets such as establishing mobilising laboratories, pesticide and bio-control laboratories, construction of community irrigation facilities, soil and water conservation structures, construction of shallow wells, bore wells, drains, soil testing laboratories, increase in area under improved varieties and so on. Under these projects, farmers were also trained and built capacity to apply new technologies, given certified seeds, organic inputs, improved breeds of animals, tarpaulins, solar lanterns and similar useful inputs. Outcomes of the projects, as reported by the implementing agencies, among others include increase in productivity of various crops, improved soil fertility, improved water infiltration, increased seed germination, reduced cost of cultivation, improved training facilities, increased milk yield, wool production, increase in youth employment and enhanced farmers' knowledge and skill in doing farming activities.

The implementing agencies reported that an important constraint faced while dealing with the nodal agency was accessing fund on time. Though the project was approved for a given budget, the fund released during implementation of the project was considerably less than the allocated amount. At the research institute level, the implementing agencies reported many problems including unavailability of skilled man power, unavailability of full time dedicated Scientists and supporting staffs including Technical Assistants, lab assistant and lab attendees. There was a problem in getting contractual trained persons for follow up of project activities. Even though the infrastructure facilities for training and capacity building were established, there was a need for involvement of extension specialists to extend those infrastructural facilities to the farmers through some of the schemes implemented by ATMA and Agricultural departments.

Analysis of primary survey data revealed that some of the sample households benefited from more than one programme implemented under RKVY. The highest proportion of farmers surveyed benefited from agriculture development, water resource and soil conservation department activities. Thus, more than 78 percent of farmers have benefited under these two projects. Around 14 percent each of total sample farmers benefited from horticulture and micro/minor irrigation projects. Farmers benefited under animal husbandry constituted about 3.3 percent.

The sample farmers reported many problems in accessing the subsidy under RKVY. About 61 percent of the sample farmers reported problems in getting too many documents for availing subsidy under RKVY. The sample farmers particularly marginal and small farmers indicated that contact details of the department which provides subsidy are not easily available. A higher proportion of the sample farmers also indicated that eligibility or other criteria for availing subsidy are not known and hence they refrain from approaching the agriculture department for more details. The sample farmer indicated a strong need for building capacity of farmers in using new technology through field visits and training programmes. Some sample beneficiary farmers indicated that timely availability and quality of inputs are very important for improving crop yield and achieving higher income.

Achievement of RKVY Scheme

Agriculture Department

- High-level of rainfall (2500 mm per annum) spread over 120 days supports agriculture of the State that has poor status of irrigation; dominance of high-value horticultural crops in the hill-State enhances farmers' income; agricultural income per hectare (ha).
- During the evaluation, our field team have found that the construction of dams under RKVY in Meghalaya have made some positive impacts:
    a) Under RKVY check dams were constructed to provide incidental irrigation during late Khariff and Rabi by storing water at the end of monsoon mainly through lifting devices.
    b) Dams for Ground Water recharge.
    c) Irrigation use of water flowing down drainage channels.
    d) To divert water from perennial / semi-perennial streams in hilly areas for irrigation purpose.
    e) Other uses by villagers like bathing, washing, fishing, recreation etc. depending on location and potentiality.
- Shallow tube wells have contributed significantly to the increase in the level of input use and realization of higher yields and returns from crops.

- Mechanization in Agriculture is very crucial for timely farm operations for increasing production and productivity of crops. The provision of power tillers, improved power and manually operated farm implements and canopy management tools are also the incentives that have made a difference during the recent years through the scheme.
- During field visit it was found that some of the dams have rusted due to landslides. This was the major setback. hilly areas usually this areas affected from the landslide, and these landslides affected badly to the dams which was the major setback found.
  - Theses dams are still in same condition because there is no provision for repair and maintenance.
  - Shallow Tube Well not feasible in Hilly areas due to low water level at the ground which will not be sufficient for standing crop (Paddy) during winter.
  - In many of the visited areas sluice gates have got rusted due to hilly landslides.
  - Less awareness about modernized farming methods.

Horticulture Department

- During the evaluation study, it has been discovered that Significant expansion of area and production of low volume high value crops like strawberry, anthurium and coloured capsicum led to income and employment generation among farmers. The State is one of the top producers of strawberry. These crops have also come up in non-traditional districts like West Khasi Hills, Jaintia Hills, and South Garo Hills. New and improved technologies have been inducted in the form of micro-irrigation and protected cultivation in farmer's fields. It is perceived from the study that crop cultivation under RKVY in seven districts of Meghalaya has seen major improvement. For ex. In tomato cultivation East Khasi Hill district set an positive example under horticulture.
- The department has successfully set up Horticulture Hubs in all the seven districts of the State with specialization in flowers and high value vegetables. Each horti hubs is served by spokes comprising collection centres and crop clusters of surrounding villages within a radius of 10 Km.
- The use of green house technology, poly-houses, drip and micro irrigation system, water harvesting structures, fustigation, soilless culture has helped in minimizing risk and helped

farmers overcome the vagaries of nature as well as to standardize quality of produce and reduce economic losses.

- The horticulture department has adopted a modernized and attractive approach. The projects so far has created lot of interest amongst the beneficiaries particularly the housewifes and young farmers.
- The sub schemes under the project titled "Development of hub and spoke model of Horticulture" has helped a lot in flourishing the Horti Culture amongst the people of the region. It helped in achievement of sustainable amount of income.
- In every district in the state the department is having collection centres and required facility for storage of items.
- The major infrastructure support provided under RKVY is for development and upgradation of horti hubs in all the districts through fencing, installation of pump set, Diesel generator, Water harvesting tanks, guest houses, grading hall etc., Green house, low cost poly house, carnation spoke etc.
- Marketing is the major weakness of the State. The topography and poor connectivity are the major hurdles for the development of horticulture in the State. The monopoly of the private traders, weak cooperatives and lack of market intelligence are the major constraints in marketing.
- Capacity building was a major weakness found in the horticulture sector under RKVY. From the table it is clear that only 10% of the respondent is highly satisfied with the training programmes conducted. However, 35% of the respondents are not fully satisfied with the training programmes conducted. While around 55% of the respondents have not participated in any training programme. Based on the field visits and available data it is suggested to undertake more capacity building programmes and also encourage the trained farmers to be the facilitators to spread appropriate technologies to the neighboring farmers. For adopting new technologies and techniques for farming, the farmers are into the requirement of capacity building in this area.

Animal Husbandary & Veterinary Department

- Under RKVY scheme, 14 different schemes have been implemented in different districts. Out of these, 50% of the schemes are based on community piggery. All the schemes implemented are showing good progress especially the Poultry farm at Nongpiur, cattle farm and the Pig farm at Khliehtyrshi.
- Pig Farm and Poultry Farm at Nongpiur was established under RKVY in 2008-09 and 2009-10 respectively with the sole aim to augment production of quality seeds for interest of farmers. Since creation of post as required in these farms are lying pending, the department has made stop gap arrangement in redeploying officer and staff from various establishment. Both the farms are performing well, but they will need creation of post accordingly.
- The veterinary dispensaries at Ichamati and Khonglah were constructed but still lack Grade IV staff.

Water Resource Department:

- Under the RKVY scheme, the irrigation department has focused on rain water harvesting structures which can help in irrigation throughout the year. Maximum no. of RWH schemes are implemented in West Khasi Hills, East Khasi Hills and Ri Bhoi, while the least is in South Garo Hills. Around 920 numbers of families have been benefited under this scheme.
- The structures built under the scheme are quite okay, while the lack of staff for supervision is a concern. So far, the thrust in these sectors is in Area expansion of Boro Paddy through irrigation support to increase the yield to 3-4 MT/Ha as against the existing 1.5-2.00 MT/Ha.
- During the study the major weakness in this department found was lack of staff for supervision of schemes under this.
- Almost in all the districts there is not much emphasis on formation of Water Users Association (WUA). Even though it is being formed in districts, the participation is not there. Even most of the beneficiaries are not fully aware of the purpose of formation of WUA.
- Due to financial incapability almost 69% of the cultivable land remains un irrigated, while 27.5% say it is due to water scarcity.
- In hilly terrain problems of head load leads to high cost of the project. Due to non availability of proper vehicles it is difficult to supervise the works. Shortage of manpower in the

department, land disputes between the farmers lead to delay in completion. Due to erratic and prolonged rainfall working season is confined 4-5 months in a year, hence the Irrigation funds needs to be released during onset of monsoon. There is no provision for repairing and maintenance work for conveyance system.

Soil & Water Conservation Department

- During the last three years the department has undertaken several projects for the improvement of traditional water conservation system and agricultural productivity in the state. Apart from these, step were also taken for restoration of cultivable land affected by mining and quarrying. Around 35 works were undertaken under different schemes in 10048.06 hectares.
- The Soil and Water Conservation Department has taken several steps under the Jhum control scheme focusing on Land Development, Afforestation, Water Conservation and distribution works, Cash crop development, Follow-up programme, Camp and camp equipments, Dwelling house, link roads etc.
- During the study it was discovered that the Present norms covering of Rs. 16500/ Ha are too low for a hilly District which reduce the effectiveness of the Programme.
- It was also found that farmers are require of awareness programme relating to soil erosion and water conservation.

Fisheries Department:

- During the survey, while interviewing the beneficiaries it was found that under this scheme government has provided them various opportunities. With the help of these the yearly production has increased which contributes toward the family income and improves the financial condition.
- During the study it was found that the cost of construction of fishing pond in hilly area is more, therefore, lack of fund for monitoring of schemes was found as a major weakness.
- Lack of vehicles and shortage of manpower were also found as major problems.
- Some of the positive case studies of beneficiary were also found as a positive example of the improvement under this scheme.

- During the last five years approximately around Rs. 30.33 Cr. have been released for different projects under RKVY. Out of which an amount of Rs. 23.83 Cr. had utilized for Area Expansion of Individual Ponds and Rs. 6.50 Cr. had utilized for infrastructure development.
- Around 3677 number of beneficiaries has been benefitted under the scheme "**Area Expansion of Pond Aquaculture"** and 74 numbers of Community Ponds have been developed under NMPS. The total area covered under the scheme is 508.2 hectares.

Recommendation/ Suggestions

Agriculture Department

- The irrigation check dams has helped in transforming the agriculture of the surrounding areas by holding the monsoonal rains for longer after they have stopped, still there is need for new and sustained irrigation techniques which will in turn prolong the crop growing season.
- There is an urgent need of provision for repair and maintenance of rusted dams in the districts of Meghalaya.
- There needs to be major focus for the construction of bank stabilization (retaining wall) in the paddy fields, to protect the paddy fields from being washed away during heavy rainfall. Till now the scheme is mainly focused on construction of mini check dams. This may not lead to any major impact on productivity.
- There also needs to be more focus on schemes likes land reclamation, compost pits, fencing for winter cropping, farm mechanization etc.
- There is need for creating more awareness on crop models. Similarly, knowledge base concerning SRI /line planting practices need to be improved, since these two practices are widely propagated. Furthermore, during focus group discussion it was revealed farmers are not confident with the rationale behind the use of the technologies and also their application for different cropping situations, pest management, soil health management etc, More directed efforts have to be put by the project authorities to empower farmers on `how` & `why` of technologies. There is also a lack of confidence amongst the farmers for adopting

modernized mechanism. There needs to be adequate training programmes on nursery management. There also needs to be an intensive public awareness campaign.

- Creation of post for field staff and appointment of permanent engineering staff at district level under Agriculture department.

Horticulture Department

- Capacity building is an important component for all the beneficiaries as well as official to the successful implementation of schemes. Therefore, training for the beneficiaries has to be organized at the district level. Active SHGs and Co-operative members may be engaged for training. This will build local capacities and strengthen the organisations. Selected members may be trained along with the Programme managers. They will be trained intensively and material will also be provided. These trainers can be from any district in the region. Thus, two batches of trainers will enlist and provided training so that they can in turn train the beneficiaries.
- It was found during the survey that farmers require of demonstration of best practice for adopting new technologies. Presentation of new technologies and crop management practices are being taken up on the fields of progressive farmers who have got the assistance for inputs. The success stories of the farmers will be documented by audio-visual methods and shown to other farmers for their awareness and learning.
- While restoration of cultivable land affected by mining and quarrying, there needs to be inclusion of affected person's perceptions, opinions and defined needs in the planning of any mitigation actions so that local realities and local priorities are properly incorporated. The planning and design process under restoration scheme needs to suit all interested parties and their issues such as later access rights by different sections of the community. The planning and design processes needs to be linked to the form of the forest restoration as plantations (single or multiple species, timber or multi-use species).

Water Resources Department

- The structures built under the scheme are quite okay, while the lack of staff for supervision is a concern. So far, the thrust in these sectors is in Area expansion of Boro Paddy through

irrigation support to increase the yield to 3-4 MT/Ha as against the existing 1.5-2.00 MT/Ha. There is a need for implementation of such schemes in a larger scale in the state.

Soil and Water Conservation Department

- Based on the findings related to this it was found that there is a need to aware farmers to soil erosion and water conservation. Therefore, awareness programme relating to soil erosion and water conservation should be organized.

Animal Husbandry & Veterinary Department

- Major approach and effort should be to enhance women's access to livestock assets so as to enable them to avail benefits of various livestock development programmes and policies. This may include evolving women self-help groups or women livestock producers' association for availing credit for securing livestock and inputs; insurance to manage risk, and inputs and services to improving animal productivity.
- Special programmes should be initiated for developing women entrepreneurship along the livestock value chain including production, processing and marketing so as to enable them to face the emerging challenges in production and marketing. Besides, women being closely associated with animal husbandry have a better understanding and knowledge of animal behavior in respect of reproduction, feeding, symptomatic changes in animal health and response to external factors. It is suggested to enhance women's skill in various aspects of animal breeding, health, feed and nutrition, management and marketing.
- To boost animal productivity and income of the beneficiaries there is a need for appropriation of technologies that reduce drudgery to beneficiaries and improve animal health and nutrition. Improve women's access to services through appropriate training programs/ extension programmes as to enhance their capacity in clean livestock production and livestock management to improve resilience of livestock to climate change.
- It is essential to accord utmost priority to develop appropriate livestock extension system to fully exploit its potential for agricultural growth and rural development.
- A differentiated approach of providing extension and input services would be necessary to address the various technical, advisory and financial needs of different livestock production

systems and species. This would call for building up an exclusive cadre of extension workers with appropriate skills and knowledge.

- Presently the major activities of ATMA are confined to improving crop production. There is a need to strengthen ATMA with AH experts to coordinate various extension and training activities; the private AI and other workers could be effectively utilized for providing extension services.
- The Department of AH&Vt should have special "Extension Cell" with matching official machinery in the states for formulation and implementation of programs.
- Animal Husbandry Departments should have state-of-the-art infrastructure in the area of food safety, quality control assurance and research for foods of animal origin and animal feed for offering service to dairy farmers, food processors, consumers, etc. Establishment of testing and authentication by a standard facility like as proposed will also enhance the export potential of food items from the region.
- There is a major concern over the adulteration and substandard quality veterinary drugs. There are no facilities available for veterinarians or even Govt. procurement agencies to check the quality standards of veterinary drugs and potency of vaccines available in the market.

Fisheries Department

- Under fisheries department the construction cost needs to be increased for better implementation. The funds need to be disbursed on time so that the scheme could be completed well on time.
- Through the pond expansion scheme there has been upliftment in the socio economic position of the fish farmers, but there needs to be more awareness and capacity building activities for the participation of beneficiaries in a right path. They need to understand the benefit of fishing and the changes it can bring in their life style.

Cooperation Department

- Cooperative societies need the freedom for Associations to make decisions at the member's level.

- Develop cooperative actions at village level to empower farmers to seek other opportunities to address risks, gain access to financial services, encounter more economic opportunities and improve the democratization processes.
- Help the system that delivers and disseminates information to Cooperative societies to improve their functionality.
- Women and youths participation in cooperatives should be encouraged and enhanced.
- More professional management of cooperative businesses is needed (human capital in cooperative management) at all levels.
- Financial services should be in close proximity and easily available of members and the cooperatives.

****

Information Schedule (RKVY) – (State/District Level)

State: _____ District: _____

Implementing Department:_____

Implementing Agency: _____

Name & Designation of the Respondent:_____

1) Details of Projects (Since Inception till 2012-13)

Financial Year	Name of the Project / Unit	No. of Beneficiaries	Activities undertaken	Financial Expenditure Incurred	Project Status (ongoing/ Completed)

(Use separate sheets for additional information)

2) Did you prepare any comprehensive State Agriculture Plan (SAP) by integrating the district plan while implementing the RKVY?

Yes – 1 No- 2 Can't Say – 3 Don't Know- 4

3) Does the entire district have formulated a District Agriculture Plan (DAP) by including the resources available from other existing schemes?

Yes – 1 No - 2

If yes, Explain_____

_____

4) Are there any State Level Sanctioning Committee (SLSC) Constituted?

Yes – 1 No - 2 Can't Say - 3

If yes, Describe the composition of SLSC constituted _____

_____

5) What is the frequency of SLSC meetings? *Annually, Quarterly, Half Yearly, Monthly*

6) Are the SLSC meetings being conducted in the presence of Central Government Representative? *Yes -1 No- 2*

7) Details of Allocation of funds under RKVY? (Since inception till 2012-13)

Financial Year	Total Plan Expenditure	% Expenditure incurred

(Use separate sheets for additional information)

(AGRICULTURE DEPARTMENT/ HORTICULTURE DEPARTMENT)

8) Give details of major / mini irrigation check dams constructed under RKVY since inception till 2012-13?

Financial Year	District	Location –wise details of no. of major/mini check dams constructed	Expenditure incurred	Command area (in.hec.)	Farmers Benefited (in nos.)

(Use separate sheets for additional information)

9) Details pertaining to operational and non-operational check dams (if any)?

Name of the Project/Unit	Operational	Non-Operational	Reason (incase of non-operational)

(Use separate sheets for additional information)

10) Do you think construction of check dams have helped in ensuring rural sustainable livelihood in your region? If yes (in what way), If No (Why do you think so?)

_____

_____

_____

11) Give details on:-

Particulars	Location	(in Nos.)	District
SLUICE GATES			
SURFACE WATER PUMPS			
SHALLOW TUBE WELLS			
Any other (give details)			

(Use separate sheets for additional information)

12) Major focus area under RKVY?

_____

_____

_____

_____

13) Did you face any constraints while implementing of the scheme? If yes? Explain?

_____

_____

_____

14) Give your suggestion in terms of further improvement of the scheme?

_____

_____

_____

(WATER RESOURCE AND SOIL & WATER CONSERVATION DEPARTMENT)

8) Give details of Projects under RKVY since inception till 2012-13?

District	Name of Project/ Scheme	Location	Nos. of beneficiaries	Activities undertaken	Command area	Operational/ Non-operational

(Use separate sheets for additional information)

12) Major focus area under RKVY?

_____

_____

_____

_____

13) Did you face any constraints while implementation of the scheme? If yes? Explain?

_____

_____

_____

14) Give your suggestion in terms of further improvement of the scheme?

_____

_____

_____

(FIHERIES DEPARTMENT)

8) What are the different type of technology adopted by the department for up-gradation and modernization of farm? Explain briefly?

_____

_____

_____

9) Give details of project (Since inception till 2012-13)

Financial Year	District	Location of farm	Verities of seeds supplied	Quantity

10) What has been impact on production from modernization and up-gradation of farms?

_____

_____

_____

11) Details pertaining to area expansion of Pond Aquaculture? (Since inception till 2012-13)

Financial Year	Details of activities carried out under Area Expansion of Pond Aquaculture	District	Location	Nos./ Unit	Area (in Ha)	Expenditure incurred	No. of Beneficiaries

12) What were the benefits derived by the beneficiaries as a result of Pond Expansion?

_____

_____

13) Major focus area under RKVY

_____

_____

14) Did you face any constraints while implementing of the scheme? If yes, explain?

_____

_____

15) Identify the strength and weakness of the RKVY scheme under fisheries Department.

Strength

_____

_____

_____

_____

Weakness

_____

_____

_____

_____

16) Give some suggestions in terms of further improvement of the scheme.

_____

_____

_____

(Animal Husbandry and Veterinary Department)

11) Details of project under RKVY (Since inception till 2012-13)

Financial Year	Name of the project/ Scheme	Location	Nos. of beneficiaries	Activities undertaken	Financial expenditure incurred	Project Status (On-going/ Completed)

12) Major focus area under RKVY

_____

_____

13) Did you face ant constraints while implementation of the scheme? If yes, explain?

_____

_____

14) Identify the strength and weakness of the RKVY scheme under AH & Vt. Department.

Strength

_____

_____

_____

_____

Weakness

_____

_____

_____

_____

15) Give some suggestions in terms of further improvement of the scheme.

_____

_____

_____

Evaluation of Rashtriya Krishi Vikash Yojna (RKVY)

(Sponsored by: Directorate of Programme Implementation & Evaluation, Government of Meghalaya)

Beneficiary Schedule (Agriculture/ Horticulture Department)

District Name_____ Block Name_____Village Name _____

Basic Information

1. Name of the Beneficiary : _____

2. Address: _____

_____

3. Qualification: 1. Illiterate 2. Literate 3. Primary 4. Middle School 5. Matriculate
6. Intermediate 7. Technically Qualified 8. Graduate & Above

4. Religion : 1. Hindu 2. Muslim 3. Christian 4. Others (Plz. Specify)

5. Category : 1. Gen 2. OBC 3. SC 4. ST 5. Others

6. Category of Family : 1. APL 2. BPL

7. Age of Beneficiary: (in yrs)

8. Sex : 1. Male 2.Female

9. Average Land Holding: _____ (in acres.) 11. Annual Income: Rs. _____

10. Annual Income (Agriculture Related Activity): Rs _____

11. Size of Family: Total : _____ Male: _____ Female: _____

12. Current Principal Occupation: please tick the appropriate

( ) Agriculture wage earner	( ) Non-agriculture/unskilled wage earner	( ) Marginal Farmer
( ) Live Stock, Forestry, etc.	( ) Mining & Quarrying	( ) Household Industry
( ) Building/Road Construction	( ) Trade and commerce	( ) Transport & communication
( ) Traditional Artisan	( ) Service (eg. Washerman)	( ) Tailoring

13. Whether Disabled? 1. Yes 2. No

14. Land Holding Detail:

Detail	**Area (in acres)**	
Non-Agricultural land		
Barren land		
Agricultural land	**Irrigated**	**Unirrigated**
Owned		
Leased-in		
Leased-out		

15. Alternate Source of Irrigation for the land: Type of well: a) Shallow b) Open well c) Bore well

Water Lifting Device: a) Power b) Manual c) Others (Specify)

16. Ownership: a) Owned b) Neighbours c) Community

17. How often requirement becomes necessary to seek alternative water resource:

a) Always b) Very Often c) Occasionally d) Rarely

18. Water Rates payment detail: Periodicity of payment: Season wise / Monthly / Installments

19. Cropping pattern by you in last five years:

Years	Name of the crop	Areas (in acres)	No. Watering	Alternate source of water	Total yield (Quintal)	Total value	Growth (Negative/positive)
2012-13							
2011-12							
2010-11							
2009-10							
2008-09							

Awareness, Opinion & feedback

1. How do you know about the RKVY?

1. Though local newspaper/TV/AIR 2. Through Extension officers 3. Village council
5. NGO 6.DRDA 7. Other Beneficiaries 8. Friends/ Neighbour/Public figure/Members of local bodies
9. Others (Specify)……

2. What kind of benefit did you get under the RKVY Scheme? Did it help in improving in your family income?

---

3. Are you aware of any other schemes implemented by the Agriculture/Horticulture department?

1. Yes 2. No

4. Are you aware of farm mechanization? 1- Yes, 2- No

If yes, what kind of support you got under the farm mechanization?

---

5. Are you facing any kind of problem in getting benefit under this scheme? Do you think this scheme can help in improving agriculture productivity in your state?

---

5. Is there any kind of awareness programme carried out by Agriculture/Horticulture department? 1. Yes 2. No
If yes, explain

---

6. What kind of support you expect from the Agriculture/Horticulture department for increasing the productivity?

---

8. How do you rate the behavior of departmental staff, when you visit their office for any discussion?

1. Good, 2. Bad 3. Can't say

9. What is your opinion on the functioning of the department?

a) We get all help required
b) We get help only when we ask/complain
c) We get help depending on particular person
d) We hardly get any help
e) Any other reason: Specify _____

Investigators comments based on their field observation and interaction with the beneficiaries

Evaluation of Rashtriya Krishi Vikash Yojna (RKVY)

(Sponsored by: Directorate of Programme Implementation & Evaluation, Government of Meghalaya)

Beneficiary Schedule (Fisheries Department)

District Name_____ Block Name_____Village Name _____

Basic Information

1. Name of the Beneficiary : _____

2. Address: _____

_____

3. Qualification: 1. Illiterate 2. Literate 3. Primary 4. Middle School 5. Matriculate
6. Intermediate 7. Technically Qualified 8. Graduate & Above

4. Religion : 1. Hindu 2. Muslim 3. Christian 4. Others (Plz. Specify)

5. Category : 1. Gen 2. OBC 3. SC 4. ST 5. Others

6. Category of Family : 1. APL 2. BPL

7. Age of Beneficiary: (in yrs)

8. Sex : 1. Male 2.Female

9. Average Land Holding: _____ (in acres.) 11. Annual Income: Rs. _____

10. Annual Income (Agriculture Related Activity): Rs _____

11. Size of Family: Total : _____ Male: _____ Female: _____

12. Current Principal Occupation: please tick the appropriate

( ) Agriculture wage earner	( ) Non-agriculture/unskilled wage earner	( ) Marginal Farmer
( ) Live Stock, Forestry, etc.	( ) Mining & Quarrying	( ) Household Industry
( ) Building/Road Construction	( ) Trade and commerce	( ) Transport & communication
( ) Traditional Artisan	( ) Service (eg. Washerman)	( ) Tailoring

13. Whether Disabled? 1. Yes 2. No

Awareness, Opinion & Feedback

1. How do you know about the RKVY?

1. Though local newspaper/TV/AIR 2. Through Extension officers 3. Village council
5. NGO 6.DRDA 7. Other Beneficiaries 8. Friends/ Neighbour/Public figure/Members of local bodies
9. Others (Specify)……

2. What kind of benefit did you get under the RKVY Scheme? Did it help in improving in your family income?

---

3. Are you aware of any other schemes implemented by the fisheries department?

1. Yes 2. No

4. Did you get any kind of training under the scheme? If yes, are you satisfied with the facilities and training provided under the scheme by the Fisheries dept.? 1- Yes 2- No

If yes, what kind of technical support you got from the department? Explain?

---

5. Did you notice any kind of up gradation of technology in the modernization of farms? Did you get any variety of fish seeds from the farm? Kindly explain if its yes?

---

6. What benefits did you get as a result of pond expansion?

---

7. DO you think this scheme has helped resulting in a better production? 1. Yes 2. No

8. Did you avail benefit under any other government scheme? 1. Yes 2. No

If yes, Name them: _____

9. Do you have any suggestion for further improvement in fisheries sector in your state? According to you is there any Constraint, resulting the success of these scheme in your state?

---

10. How do you rate the behavior of fisheries staff, when you visit their office for any discussion?

1. Good 2. Bad 3. Can't say

11. Is there any kind of awareness programme carried out by fisheries department? 1. Yes 2. No

12. What Kind of support you need from the fisheries department for increasing the productivity?

<u>Investigators comments based on their field observation and interaction with the beneficiaries</u>

Evaluation of Rashtriya Krishi Vikash Yojna (RKVY)

(Sponsored by: Directorate of Programme Implementation & Evaluation, Government of Meghalaya)

Beneficiary Schedule (Animal Husbandry and Veterinary Department)

District Name_____ Block Name_____Village Name _____

Basic Information

1. Name of the Beneficiary : _____

2. Address: _____

_____

3. Qualification: 1. Illiterate 2. Literate 3. Primary 4. Middle School 5. Matriculate
6. Intermediate 7. Technically Qualified 8. Graduate & Above

4. Religion : 1. Hindu 2. Muslim 3. Christian 4. Others (Plz. Specify)

5. Category : 1. Gen 2. OBC 3. SC 4. ST 5. Others

6. Category of Family : 1. APL 2. BPL

7. Age of Beneficiary: (in yrs)

8. Sex : 1. Male 2.Female

9. Average Land Holding: _____ (in acres.) 11. Annual Income: Rs. _____

10. Annual Income (Agriculture Related Activity): Rs _____

11. Size of Family: Total : _____ Male: _____ Female: _____

12. Current Principal Occupation: please tick the appropriate

( ) Agriculture wage earner	( ) Non-agriculture/unskilled wage earner	( ) Marginal Farmer
( ) Live Stock, Forestry, etc.	( ) Mining & Quarrying	( ) Household Industry
( ) Building/Road Construction	( ) Trade and commerce	( ) Transport & communication
( ) Traditional Artisan	( ) Service (eg. Washerman)	( ) Tailoring

13. Whether Disabled? 1. Yes 2. No

Awareness, Opinion & Feedback

1. How do you know about the RKVY?

1. Though local newspaper/TV/AIR 2. Through Extension officers 3. Village council
5. NGO 6.DRDA 7. Other Beneficiaries 8. Friends/ Neighbour/Public figure/Members of local bodies
9. Others (Specify)……

2. Are you aware of any other Agriculture related development programmes?

1. Yes 2. No

3. Are you satisfied with the facilities and training provided under the scheme by the AH&V dept.? 1. Yes 2. No

If yes? What kind of support you get? Explain?

---

4. Do you think there has been any adoption of modern technologies to help increase a positive growth in the Diary sector? 1. Yes 2. No

If yes? What kind of support you get? Explain?

---

5. Are you getting any kind of benefit under the RKVY Scheme? 1. Yes 2. No

If yes, what kind of benefit you get? Explain?

---

6. Are the veterinary dispensaries in your locality equipped with all facilities? 1. Yes 2. No

If no, what are the lacking facilities? Explain?

---

7. Do you own a farm? 1. Yes 2. No

If yes, did you get any assistance under RKVY? 1. Yes 2. No

If yes, Explain

---

8. Do you think the RKVY Scheme will help in improving the livelihood of the beneficiaries in term of better production and increase in income? Explain the way

---

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9. Did you avail benefit under any other government scheme? 1. Yes 2. No

If yes, Name them: _____

10. Do you have any suggestion for further improvement in Animal Husbandry & veterinary sector in your state? According to you is there any constraint, resulting the success of these scheme in your state?

Investigators comments based on their field observation and interaction with the beneficiaries

Evaluatin of Rashtriya Krishi Vikash Yojna (RKVY)

(Sponsored by: Directorate of Programme Implementation & Evaluation, Government of Meghalaya)

Beneficiary Schedule (Soil & Water Conservation/Water Resource Department)

District Name_____ Block Name_____Village Name _____

Basic Information

1. Name of the Beneficiary : _____

2. Address: _____

_____

3. Qualification: 1. Illiterate 2. Literate 3. Primary 4. Middle School 5. Matriculate
6. Intermediate 7. Technically Qualified 8. Graduate & Above

4. Religion : 1. Hindu 2. Muslim 3. Christian 4. Others (Plz. Specify)

5. Category : 1. Gen 2. OBC 3. SC 4. ST 5. Others

6. Category of Family : 1. APL 2. BPL

7. Age of Beneficiary: (in yrs)

8. Sex : 1. Male 2.Female

9. Average Land Holding: _____ (in acres.) 11. Annual Income: Rs. _____

10. Annual Income (Agriculture Related Activity): Rs _____

11. Size of Family: Total : _____ Male: _____ Female: _____

12. Current Principal Occupation: please tick the appropriate

( ) Agriculture wage earner	( ) Non-agriculture/unskilled wage earner	( ) Marginal Farmer
( ) Live Stock, Forestry, etc.	( ) Mining & Quarrying	( ) Household Industry
( ) Building/Road Construction	( ) Trade and commerce	( ) Transport & communication
( ) Traditional Artisan	( ) Service (eg. Washerman)	( ) Tailoring

13. Whether Disabled? 1. Yes 2. No

14. Land Holding Detail:

Detail	**Area (in acres)**	
Non-Agricultural land		
Barren land		
Agricultural land	**Irrigated**	**Unirrigated**
Owned		
Leased-in		
Leased-out		

17. Alternate Source of Irrigation for the land: Type of well: a) Shallow b) Open well c) Bore well

Water Lifting Device: a) Power b) Manual c) Others (Specify)

18. Ownership: a) Owned b) Neighbours c) Community

19. How often requirement becomes necessary to seek alternative water resource:

a) Always b) Very Often c) Occasionally d) Rarely

20. Water Rates payment detail: Periodicity of payment: Season wise / Monthly / Installments

21. Cropping pattern by you in last five years:

Years	Name of the crop	Areas (in acres)	No. Watering	Alternate source of water	Total yield (Quintal)	Total value	Growth (Negative/positive)
2012-13							
2011-12							
2010-11							
2009-10							
2008-09							

Awareness, Opinion & feedback

1. How do you know about the RKVY?

1. Though local newspaper/TV/AIR 2. Through Extension officers 3. Village council
5. NGO 6.DRDA 7. Other Beneficiaries 8. Friends/ Neighbour/Public figure/Members of local bodies
9. Others (Specify)……

2. What kind of benefit you got under the RKVY Scheme? Is it helped in improvement in your family income?

---

3. Are you aware of any other schemes implemented by the Soil & Water Conservation department?

1. Yes 2. No

4. Are you facing any kind of problem in getting benefit under this scheme? Do you think this scheme can help in improving agriculture productivity in your state?

---

5. Is there any kind of awareness programme carried out by Agriculture/Horticulture department? 1. Yes 2. No
(If yes, explain

---

6. What kind of support you expect from the Soil and Water Conservation Department for increasing the productivity?

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8. How do you rate the behavior of departmental staff, when you visit their office for any discussion?

1. Good, 2. Bad 3. Can't say

9. Have you formed or been a member of any Water Users Association or any other such farmer's cooperative group?

1. Yes 2. No

(If yes what is the role of your organization?

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10. What are the reasons for cultivated area remaining un-irrigated (completed or partially)?

a) Due to absence of irrigational channels b) Scarcity of water c) Uncertainty about supply

d) Conflicts with fellow

11. How does the irrigation department communicate to you about water release?

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12. What is your opinion on the functioning of the department?

a) We get all help required b) We get help only when we ask/complain

c) We get help depending on particular person d) We hardly get any help

e) Any other reason: Specify _____

13. Is there any rain water harvesting method adopted in your village? Kindly explain?

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14. According to you what needs to be done for restoration of cultivable land affected by mining and quarrying?

<u>Investigators comments based on their field observation and interaction with the beneficiaries</u>