RI BHOI DISTRICT

Inventory of Agriculture 2015

ICAR - Agricultural Technology Application Research Institute, Umiam (Barapani)
Ri- Bhoi District, Meghalaya - 793103

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Published by: **The Director,**
ICAR-Agricultural Technology Application Research Institute, Umiam (Barapani), Meghalaya-793103
Email: icarzcu3@gmail.com
Website: http://icarzcu3.gov.in
Phone no. 0364-2570081

Compiled By:
Dr. Md. Mokidul Islam, Programme Coordinator
Dr. S.K. Baishya, SMS (Animal Science)
Dr. Utpal Barua, SMS (Horticulture)
Ms. Meghna Sarma, SMS (Agronomy)
Mrs. Mousumi G. Das, SMS (Plant Protection)
Mrs. Eliza Syiemlieh, SMS (Home Science)
Mr. A.K. Tripathi, ATARI Zone-III
Ms. Genialda Nongtdu, SRF (NICRA Project)
Ms. Sharmila Rai, SRF (NICRA Project)

Edited by: **Amol K. Bhalarao, Scientist (AE)**
Bagish Kumar, Scientist (AE)
A. K. Singha, Pr. Scientist (AE)
P. C. Jat, Sr. Scientist (Agro)
R. Bordoloi, Pr. Scientist (AE)
Bidyut C. Deka, Director, ATARI Umiam

Contact: **Dr. Md. Mokidul Islam**
Krishi Vigyan Kendra Ri Bhoi,
ICAR Research Complex for NEH Region,
Umroi Road, Umiam – 793103, Meghalaya
Telephone Number: 0364-2570011
Mobile Number: 9856252939/9089611347
Website of KVK: www.kvkribhoi.nic.in

Word Processing: **Synshai Jana**

Cover Design: **Johannes Wahlang**

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FOREWORD

The ICAR-Agricultural Technology Application Research institute, Zone-III with its headquarters at Umiam, Meghalaya is primarily responsible for monitoring and reviewing of technology assessment, refinement, demonstrations, training programmes and other extension activities conducted by the *Krishi Vigyan Kendras* (KVKs) in North East Region, which comprises of eight states, namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The directorate also serves as feedback mechanism to research and extension systems while maintaining a very close liaison with ICAR headquarters and has made significant progress in research, capacity building and other extension activities which ultimately contributes for the planned growth and development of North Eastern Region of India.

Through this District Agriculture Inventory publication, an attempt has been made to compile and publish information about KVK district and agriculture in district, in a meaningful and comprehensive manner. It will be very useful for all stakeholders of agriculture in district. The inventory encompasses the information regarding geography of district; basic data about agriculture and district population, crops, institutional resources, agriculture relates schemes in district which also covers agriculture, fishery and livestock sector. The district inventory in the form of e-publication will surely increase the digital presence and penetration of KVKs. The inventory will also serve the communication needs of farmers and youth in district as it contains contact numbers and address related information to access various developmental agencies in district.

I congratulate the efforts of staff of KVK for collecting and compiling such a large volume of information in systematic manner. I also acknowledge the efforts of editors and other staff members of this institute for publishing this document on our website.

Umiam
18-03-2016

(Dr. Bidyut C. Deka)
Director,
ICAR-ATARI-Umiam,
Meghalaya-793103

PREFACE

The synthesized compilation in the form of informative publication is of much value for decision making. The compiled information in this publication will immensely help farmers and other stakeholders of agriculture and allied sector of a district such as line departments, research organizations, planners, policy makers, input providers etc. Through this document, we are trying to provide entire gamut of information related to district and its agriculture setting for the benefit of farming community of the North Eastern Region. The connectivity related issues in the North Eastern region makes the information inaccessible to most of stakeholders. Therefore, the *Krishi Vigyan Kendras* in each district of North East region undertook this cumbersome task to compile the district Agricultural Inventory. This publication provides the latest information about district, agriculture and other essential constituents.

We, the editors of this publication, earnestly thank and acknowledge the contribution of all compilers i.e. Programme coordinator, Subject Matter Specialists and Programme Assistants of KVK Ri Bhoi for taking part in compiling the huge information to shape up Ri Bhoi District Inventory of Agriculture-2015. We also thank all officers of ICAR H.Q. for guiding us time to time and motivating us to complete this publication.

We, the editors, dedicate this publication to the farming community of Ri Bhoi District and we look forward to contribute more for the betterment of farming community in entire North East Region. We also welcome the suggestions for further improvement.

Umiam Editors
18-03-2016

From the Desk of Programme Coordinator, KVK Ri Bhoi

The primary purpose of this Inventory of Agriculture of Ri Bhoi District is to provide basic information on agriculture and related fields in the district. Publications regarding agriculture and related fields are still not readily available to the farmers in the district. The farmers are also unaware about the different agricultural organizations, schemes and programmes that are functioning in their own district. This further leads to slow diffusion and adoption of the new technologies. Thus, this inventory was published with the aim to create easy access to agriculture related information in the district.

In this inventory, an attempt was made to compile all the available information about the district and its agricultural scenario, constraints related to agriculture, research and development organizations, agricultural schemes and programmes and the different agricultural tools and implements which are suitable for this region. The compilation will be periodically updated to include changes that are likely to happen due to policy changes.

The authors would like to express their sincere gratitude to all the staff of KVK, Ri Bhoi who have directly or indirectly contributed to the successful compilation of this inventory.

We would like to dedicate this publication to the farming community of Ri Bhoi District and we hope that it will make a difference in the lives of the farmers.

***(Md. Mokidul Islam**)*

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CHAPTER- I DISTRICT IN GENERAL

CLIMATE

Ri Bhoi District experiences different types of climate ranging from tropical climate in the areas bordering Assam to the temperate climate adjoining the East Khasi Hills District. The areas bordering Assam experience hot - humid weather during summer seasons with an average temperature of 30 ° C, especially during the month of May to July of the year. In other areas like Lum Raitong and Lum Sohpetbneng Plateaus, the climate is severely cold during the winter months and is pleasant during the summer period. Thus, the temperature in the district ranges approximately between 2° C and 36° C. The District receives an average annual rainfall of 1636.46 mm. The maximum rainfall is in the month of June and July.

The soils of the district are derived from Gneissic complex parent materials; they are dark reddish brown in colour varying in depth from 20-200 cm.There texture of soils varies from loamy to fine loamy. The soil fertility has been derived into four classes namely (i) High Low Medium (HLM) (ii) High Medium Medium (HMM) (iii)Medium Medium Low (MML) (iv) Medium Low Medium (MLM) have been established from the soil test so far compiled in the soil testing laboratory of the state.

Agro climatic zones:

The district can be divided into two zones:

(i) Sub-Tropical Hill Zone: This zone covers almost whole of Ri-Bhoi district except the southern part.

(ii) Mild Tropical Hill Zone: This zone covers only the southern part of the District.

TOPOGRAPHY

The district lies between 90°55'15 to 91°16' latitude and 25°40' to 25°21' longitude. It is bounded on the north by Kamrup district and on the East by Jaintia Hills and Karbi Anglong district of Assam and on the West by West Khasi Hills district. The total area of the district is 2448 sq. Km.

Ri Bhoi being one of the components of the Meghalaya plateau has its physiographical features almost similar to that of the Khasi Hills. The Hills gently slope towards Brahmaputra valley of Assam in the north, overlook the gentle plains of this mighty river in the central portion and the basin of Kamrup District in the west. The geological structure of Ri Bhoi district is mainly composed of Archaean Gneissic Complex, except some strips at the fringe between Jirang Syiemship, Mylliem Syiemship (Khanapara and Beltola areas) and Kamrup district which is covered with alluvial soil. The North-East portion which is contiguous to Block-II areas is composed of proterozoic i.e Granite. Thus Granite is one of the major minerals of this district which has economic value and is marketable when the same is properly processed. The important rivers flowing through this region includes the Umtrew, Umsiang, Umran and Umiam rivers.

FORESTS

The recorded forest area in the state is 0.95 million ha, which is 42.34% of the geographic area. According to legal classification, Reserved Forests, Protected Forests and unclassified Forests constitute 11.71%, 0.13% and 88.16% of the total forests, respectively. The control of unclassified forests mostly rests with the autonomous district councils of Khasi hills, Jaintia hills and Garo hills.

Table : Area under different types of forest

Category	Area under forest (in Sq.Km)	% Of forest area
Reserved forests (including national parks, biosphere reserves and sanctuary)	1112	11.71

Unclassed Forests	8372	88.16
Protected Forests	12.00	0.13
Total	9496.00	42.34

Ref: State Forest report, 2003

Table : Status of forest covers in different districts of Meghalaya

District	Total Area (sq.Km)	Forest Area (sq.Km)	Forest (%)
East Khasi Hills	2748	971.14	35.34
West Khasi Hills	5247	2808.20	53.52
Jaintia Hills	3819	1761.70	46.13
West Garo Hills	3714	2022.27	54.45
South Garo Hills	1850	1186.03	64.11
East Garo Hills	2603	1519.63	58.38
Ri-Bhoi	2448	1229.87	50.24
Total	22,429	9496	42.34

Ref: Govt. of Meghalaya

Classification of forests

The forests of Meghalaya can broadly be grouped under the tropical and temperate type, based mainly on the altitude, rainfall and dominant species composition.

A. Tropical Forests

These forests are found in areas upto an elevation of 1200m and with an average rainfall of about 100-250 cm.There are numerous subtypes within this category such as evergreen, semi-evergreen, moist and dry deciduous forest, etc.

B. Tropical Evergreen Forests

These forests usually occur in high rainfall areas as well as near catchment areas. They seldom form continuous belts due to various exogenous factors. But still, they harbour very rich species diversity, where nature is at its extravaganza forming a closed

evergreen canopy. The trees exhibit clear zones with dense and impenetrable herbaceous undergrowth.

C. Tropical Semi-Evergreen Forests

This category of forests occupies the northeastern and northern slopes of the state, typically up to elevations of 1200m, where annual rainfall is 150-200cm with a comparatively cooler winter. The numbers of species here are fewer than the evergreen zone. There are also a few species in these forests, which are deciduous in nature, such as Careya arborea, Dillenia pentagyna and Callicarpa arborea. Again there is a clear stratification of the trees in these forests.

D. Tropical Moist and Dry Deciduous Forests

This type of forests occurs where annual rainfall is below 150cm and at comparatively low elevations. Typical natural deciduous forests do not occur anywhere in Meghalaya but are only sub climax or man-made forests. These forests are characterized by seasonal leaf shedding and profuse flowering of the tress. Recurrent forest fires are a common phenomenon here. Deciduous forests are much more extensive in their distribution in the state and include a host of economically important trees like Shorea robusta , Tectona grandis,Terminalia myriocarpa, Sterculia villosa, Logerstroemia flos-reginae, L.Porviflora,Morus laevigatus, Artocarpus chaplasha, and Gmelina arborea both as natural and as plantations. Schima wallichii, Artocarpus gameziana, Tetrameles mudiflora, Lannea Coromandelica, Salmalia malabarica Erythrina stricta,Premna milliflora, Vitex peduncularis, Albizia lebbeck.Lucida,Terminalia bellirica etc is also in abundance.These trees of the deciduous canopy are always lofty and straight bole and with spreading crown.

E. Grass and Savannas

Grasslands of Meghalaya are also not a climax type but are only as a result of removal of original forest cover. The rolling grasslands covering large areas can be seen throughout the Shillong plateau, around Riangdo, Ranikor, Weiloi, Mawphlang,

Mawsynram, Cherrapunji, Shillong, Jowai, and sutnga in Khasi and Jaintia Hills and major parts of West Garo Hills.

F. Temperate Forests

The temperate forests occupy the higher elevations about 1000m, mostly along the southern slope of Khasi and Jaintia Hills. The rainfall here is very high 200-500cm with a severe winter during November to March. Ground frost is also common during December to January.

G. Sacred Groves

The scared groves of Meghalaya largely fall under the temperate type and are the relic type evolved through millions of years. These are rich storehouse of vegetation wealth incomparable to any other type of forests in the state. These isolated pockets are untouched due to the religious beliefs and myths attributed to them. Many of the endangered species of the state are presently confined to these pockets only. Fagacaea members dominate over others in these sacred forests. Epiphytic flora is quite abundant and again dominated over by ferns and orchids.

Table: Area in sq. Km of Forest Type Classes of Ri Bhoi District of Meghalaya

Subtropical pine forest	Tropical semi-evergreen	Tropical moist/dry deciduous	Tropical dry deciduous and bamboo mix	Degraded	Grasslands	Agriculture/ Non forest	Built up	Sandy area	Water bodies	Total
34.97	337.19	859.73	-	364.3	-	793.19	-	13.54	45.08	2448

The forests, which are not reserved forests, are managed by respective Councils. Under them, they have three kinds of forests, the old unclassed state forests which are directly under their control, the forests owned by the clans or communities and the private forests. For the second and third categories, the District Councils have very little control

except for collection of royalty when they export the timber outside their own area for trade.

WATER RESOURCES:

The Ri –Bhoi district of Meghalaya has unique topographical condition. Consequently the district is blessed with vast and varied water resources in the forms of rivers, reservoirs, beels, lakes, swamp, pond, mini barrages and low lying paddy. The district shared maximum 20% in total area of pond/mini barrages of the state followed by 10.2, 9.23 and 2.46% in case of reservoirs, rivers, and beels, lakes etc. respectively, but no contribution in state in terms of paddy cum fish culture in the district, although it is a proven technology scope and potential of ornamental fish (Puntius bartis sp) is not so much satisfactory.

Table: Area under different water resources in the state and district

Sl.No.	Resources	State	District	% share of district
1.	River stream (km)	5600.0	511	9.12
2.	Reservoirs (ha)	8430.0	650.0	7.71
3.	Beels, Lakes and Swamps (ha)	375.0	9.24	2.46
4.	Pond/Tanks (ha)	500.0	239.86	47.97

PORTS: Nil

DEMOGRAPHY

The tribal people make up the majority of Ri Bhoi population. The population of Ri Bhoi district as of 2011 has been estimated at 2, 58,380 of which females comprise 1, 25,935

and males 1, 32,445. The population density (per sq. Km) is 106. As per the census of India 2001, the sex ratio (number of females per 1000 males) is 940 in rural areas, 951 in urban areas and the total is 941. The total number of villages in the district is 584.

Table : Demographic Information for the Ri-Bhoi District

Sl. No.	Name of the Block	Population (As per 2001 census Total)	% of Literacy	Male No.	Female No.	Workers No.		Caste No.			
						Agri	Non-Agri	SC	ST	OBC	General
1	Jirang	22,856	40	10,286	12,570	18,284	4,572	-	21,713	1,143	-
2	Umling	91,459	47	41,156	50,302	73,167	18,297	-	77,740	13,718	-
3	Umsning	1,17,168	50	60,445	56,723	93,734	23,434	203	10,262	14,541	-

**Source: Statistical Handbook Ri Bhoi District, 2010-2011*

CULTURE AND EDUCATION

The Bhois of Ri Bhoi district are the sub - group of the main Khasi Tribe. The majority of the Bhois speak the Bhoi dialect, although they use the Khasi dialect as a major subject in their schools. In Ri Bhoi district, there are other groups of tribes viz, Garos, who speak the Tibeto - Burman groups of language, whereas the Karbis, Marngars, Mikirs, Bodos and Lalungs use Assamese as their Lingua Franca. Some speak and write Khasi too. The Bhois follow the matrilineal system. Children bear the title of the mother and she is the safe keeper of all properties owned by her parents.

The total literacy in the district is 77.22%. The number of literate persons in the district is given below:

Table: Number of literate persons in the district

S. No.	Items	Reference Period	Unit	Ri-Bhoi District
(a)	Total	2011(P)		199521
(b)	Male	2011(P)	Persons	103996
(c)	Female	2011(P)	Persons	95525
(d)	Rural	2011(P)	Persons	177858
(e)	Urban	2011(P)	Persons	21576

Source: Directorate of Economics and Statistics, Govt. of Meghalaya, Shillong

HEALTH CARE SECTOR

The district has 1 hospital, 2 dispensaries, 8 primary health centres, 3 community health centres, 27 sub centres, 1 leprosy control unit, 1 set centre, 1 ayurvedic dispensary and 3 homeopathic dispensaries. The numbers of para medical staff are 57 doctors, 24 nurses (general), 14 pharmacist, 4 health visitos, 24 midwives, 59 auxiliary nurse midwives, 15 lab technicians, 4 vaccinators and 64 other Para medical personnel registered during the year for the service of the people of the district.

**Source: Statistical Handbook Ri Bhoi District, 2010-2011*

BANKING AND ALLIED SECTORS

The numbers of scheduled commercial banks in the state are 90 SBI and its associates, 55 Nationalized Banks, 54 Regional Rural Banks, 9 other Scheduled Commercial Banks and 208 All Scheduled Commercial Banks.

**Source: Statistical Handbook Meghalaya, 2010-2011*

LOCAL BODIES AND RURAL DEVELOPMENT

The hierarchy of administration in the district can be divided into five levels viz (1) The District Administration at Nongpoh, is headed by the Deputy Commissioner and his comrades-at-arms, (2) The Administrative Unit at Jirang is headed by the Administrative Officer and a team of officials, (3) The Traditional Institutions are headed by the Syiems and the Sardars, (4) The Traditional Durbars of the Syiem Raids and (5) The Village Administration by the headmen. The first two categories pertains to the Government of Meghalaya and the latter three comes within the purview of The United Khasi-Jaintia Hills Autonomous District (Administration of Justice Rules) 1953 of the District Council which were framed in accordance with the provisions of the Sixth Schedule to the Constitution of India. The jurisdiction of civil administration coincides with parts of the administrative areas of the Khasi Hills Autonomous District Council Shillong, having the office of the Area Superintendent at Nongpoh. As it is a well-known fact, the Sixth Schedule, is the only provision in the Constitution of India framed solely for the preservations of the customary practices and administrative rights of the Khasis being the natives which inter alia includes regulation of jhum control, implementation of some rural programmes, regulation of trade for non-tribals, elaka and village administration etc.

While gearing up with the developmental administration at the Block-level, the State Government has set up three Community & Rural Development Blocks at Jirang, Umling and Umsning respectively. These are the efforts to decentralize and translate Government plans into reality and to activate the cycle of development at the grass-root levels.

CHAPTER- II AGRICULTURAL SCENARIO OF THE DISTRICT

The Ri-Bhoi district was formed by further division of East Khasi Hills district on 4th June 1992. It has a hilly terrain and a large part of the area is covered with forests. The Ri-Bhoi district is famous for its pineapples and is the largest producer of pineapples in the state.

CROPS

Nearly 10% of the total geographical area of Meghalaya is under cultivation. Agriculture in the state is characterized by limited use of modern techniques and low productivity. As a result, despite the vast majority of the population engaged in agriculture, the contribution of agricultural production to the state's GDP is low and most of the population engaged in agriculture remains poor. A substantial portion of the cultivated area is under the traditional Shifting Cultivation known locally as "Jhum" cultivation.

Food grains are the most important crop in Meghalaya. These are grown in over 1,330 km², nearly 60% of the state's cultivated area. The production of food grains is over 230 thousand tonnes. Rice is the dominant food grain crop accounting for over 80% of the food grain production in the state. Other important food grain crops are maize, wheat and a few other cereals and pulses.

Oilseeds such as rape and mustard, linseed, soybean, castor and sesame are grown on nearly 100 km². Rape and mustard are the most important oilseeds accounting for well over two-thirds of the oilseed production of nearly 6.5 thousand tones.

Table: Area, Production & Yield of Agricultural and Horticultural crops (Kharif Crops)

S.No.	Name of the crop	Ri-Bhoi District		
		Area (ha)	Production (Metric tonnes)	Yield (Kg/ha)
	Agriculture			
1.	Rice			
	(a) Autumn	148	255	1725
	(b) Winter (Sali)	9253	25095	2712
	(c)Spring	198	424	2141
2.	Maize	1520	3430	2257
3.	Rapeseed &	148	65	439

	Mustard			
4.	Soybean	154	173	1123
	Horticulture			
5.	Sweet Potato	146	851	5829
6.	Tapioca	43	259	6023
7.	Arecanut	151	93	616
8.	Tea leaf	1118	894	800
9.	Black pepper	147	87	592
10.	Rubber	890	454	510
11.	Coffee	72	27	375
12.	Ginger	979	9704	9912
13.	Turmeric	121	782	6463
14.	Chillies	93	144	4955
15.	Brinjal	29	210	7241
16.	Ladies finger	81	636	7852
17.	Bottle gourd	78	859	11013
18.	Pumpkin	56	371	6623
19.	Capsicum	84	546	6500
20.	Khasi Mandarin	233	835	3584
21.	Assam Lemon	45	326	7244
22.	Pomelo	45	443	9844

Source: Directorate of Agriculture, Meghalaya

Source: Directorate of Horticulture, Meghalaya

Year: 2011-12

Table: Area, Production & Yield of Agricultural crops (Rabi Crops)

S.No.	**Name of the crop**	**Ri-Bhoi District**		
		Area (ha)	**Production (Metric tonnes)**	**Yield (Kg/ha)**
	Agriculture			

1.	Spring rice	128	188	1469
3.	Small Millets			
	(a) Finger Millets	8	8	1000
	(b)Foxtail millet	7	7	1000
	(c)Pearl Millet	-	-	-
	(d) Job's tears	-	-	-
	(e)Other Millets	-	-	-
	Total small Millets	15	15	1000
4.	Pulses			
	(a) Gram	-	-	-
	b)Beans	48	413	5563
	Other Rabi Pulses			
	(a)Pea	26	17	654
	(b)Cowpea	3	2	667
	©Lentil	-	-	-
	(d)Others	-	-	-
	Total other Rabi Pulses	29	19	655
5	Oilseeds			
	(a) Sesamum	-	-	-
	(b) Rapeseed & Mustard	148	65	439
	(c) Linseed	-	-	-
	(d) Castor	2	2	1000
	Horticulture			
6	Vegetables			
	(a) Potato	28	168	6000
	(b) Carrots	4	48	12000
	(c) Cabbage	26	246	9462
	(d) Cauliflower	23	301	13087
	(e) Turnip	26	171	6578

	(f) Radish	1	20	20000
	(g) Beet root	21	205	9762
	(h) Tomato	166	1723	10380
	(i) Knol khol	18	150	8333
	(j) Lettuce	36	162	4500
	(k) Mustard (leaves)	46	300	6522
	(l) Onion	57	536	9404
	(m)Bitter gourd	59	552	9356
	(n) Teasle gourd	46	312	6783
	(o) Ridge gourd	79	866	10962
7	Fruits			
	a) Strawberry	19	359	18895
	b) Banana	898	15215	16943
	c) Papaya	160	1296	7538
	d) Pineapple	3669	40385	11007

Source: Directorate of Agriculture, Meghalaya

Source: Directorate of Horticulture, Meghalaya

Year: 2011-12

Table: Dominant Cropping Systems

S.No.	Non-Irrigated	Irrigated
1	Potato-Rice	Rice-vegetables
2	Monocropping	Rice-vegetables
3	Rice-Mustard/pea	Vegetable based
4	Maize-mustard/pea	Cropping systems

Table: Details of crops and cropping systems in the district

Sl. No.	Name of the Block	Name	Area (in ha)	Cropping system
1	Umsning	Spices	3,200	Vegetables, flowers & rice in low lying areas.
2	Umling	Fruits	3,500	

3	Jirang	Vegetables	400	Mixed cropping and single in uplands
		Plantation crops	180	
		Flowers	40	
		Tea	798	

Table: Focus horticultural crops and varieties identified by Indian Council of Agricultural Research for NEH Region, Umiam

Crop	Suitable varieties
Pineapple	Kew, Queen
Citrus	Khasi mandarin, Assam lemon, Acid lime, Sweet orange
Banana	Jahaji, Borjahaji, Chinichampa, Malbhog
Papaya	Honey Dew, CO-2
Passion fruit	Purple, Yellow, Kaveri
Strawberry	Sweet Charlie, Ofra, Chandler
Guava	Allahabad Safeda, L-49, H-7
Peach	TA-170, Flordasun, Shan-e-Panjab, Sharbati
Pear	Baghughosa, Sand pear, Patharnakh
Potato	Kufri Khasi Garo, Kufri Jyoti, Kufri Giriraj, Kufri Megha
Cabbage	Pusa Mukta, Pusa Ageti, Green Express, Pride of India, Challenger, H-139
Cauliflower	Snowball-16, Pusa Shubhra, Himani, Pusa Himjyoti, Pusa Synthetic
Brinjal	Bholanath, Singhnath, PPC, Sel-5, RCMBL-1
Radish	Japanese White, Chinese Pink, Meghalaya local
Chow chow	Local varieties
Tomato	Arka Alok, Arka Abha, Manikhamnu, Manileima, Manithoibi, Avinash, Rocky, Cherranjeevi
Capsicum	Indame-3, Mahabharat, KT-1, California Wonder

Broccoli	Fiesta, KTS-1, Pushpa, Aiswarya
French bean	RCMFB-1, Arka Komal, Pusa Parvati
Carrot	Nantes, Pusa Yamdagni, Pusa Meghali, Hybrid-1
Sweet potato	Sonipat-2, Sree Bhadra, S-162, ST-14
Colocasia	ML-1, ML-9
Pea	Arkel, Lincoln, Azad
Ginger	Nadia, Varada, China
Turmeric	Megha Turmeric-1, Lakadong
Arecanut	Mangala, Sumangala
Black pepper	Panniyur, Hybrid 1-7, Panchami, Pournami
Gerbera	Piton, Monarch, Pink Elegance
Gladiolus	Friendship, Her Majesty, Bis Bis

Table: Total area and production of spices crops under Ri-Bhoi district

Year	Area (Ha.)	Production (MT)
1999-2000	1036	6531
2000-2001	1063	7065
2001-2002	1154	7457
2002-2003	1153	7450
2003-2004	1001	7373
2004-2005	1124	7853

Table: Total area and production of tuber crops under Ri-Bhoi district

Year	Area (Ha.)	Production (MT)
1996-1997	220	724
1997-1998	227	785
1998-1999	163	511
1999-2000	169	629
2000-2001	173	667
2001-2002	173	660

2003-2004	186	748
2004-2005	200	803

Table: Production and productivity of important commodities under the Ri-Bhoi district (2005)

Name of the commodity	Area	Production	Productivity
Fruits	3500 Ha	3500 MT	10 t/ha
Vegetables	400 Ha	2400 MT	6 t/ha
Spices	2500 Ha	2500 MT	5 t/ha
Plantation crops	180 Ha	-	-
Flowers	4 Ha	218000 nos.	
Tea	798 Ha	525 MT	

LIVESTOCK

Animal husbandry and Agriculture are related with the overall socio – economic conditions of rural tribal people of Meghalaya. Agriculture alone cannot provide the livelihood need of population due to subsistence type, monocropping and low cropping intensity. Hence animal husbandry plays a significant role in overall farming system of the state. The total livestock and poultry population of the state are 15.51 lakhs and 28.20 lakhs respectively out of which Ri – Bhoi district possesses 1.12 lakhs and 3.52 lacks respectively (Sample survey 2005- 06). The livestock availability in the district ranges from pig, cattle, buffalo, poultry, goat, rabbit and sheep. Although the district possesses a good number of livestock and poultry, the productivity of livestock and poultry is very poor due to stunted growth and low production of local breeds of livestock and poultry, non-scientific approach of livestock and poultry farming.

Table : Livestock and Poultry population in the district

Sl. No.	Category	Ri – Bhoi (Nos.)	Meghalaya (Nos.)
1	Cattle	83,121	8,87,243
	Crossbred	13,188	26,848

	Indigenous non descript	69,933	8,60,395
2	Buffalo	3,289	22,672
3	Goat	13,835	3,65,483
4	Sheep	116	21,041
	Crossbred	-	242
	Indigenous	116	20,799
5	Pig	42,470	5,24,357
	Crossbred	4,044	70,157
	Indigenous non descript	38,426	4,54,200
6	Rabbit	744	9,298
7	Poultry	3,39,941	30,26,497
	Desi	3,12,519	27,52,999
	Improved	27,422	2,73,498
8	Ducks	4,510	66,378
	Desi	2,739	58,402
	Improved	1,771	7,976

Source: Integrated Sample Survey – 2007, Directorate of Animal husbandry & Veterinary, Govt. of Meghalaya

Table: Average yield per animal (kg) per year in the district

Name	**Cattle**	**Buffaloes**	**Pigs**	**Sheep & Goat**	**Poultry**
Ri –Bhoi district	89.86	112.48	42.45	8.88	1.05
State (Meghalaya)	90.58	113.95	43.01	8.94	1.08

Source: Integrated Sample Survey – 2005 – 06, Directorate of Animal husbandry & Veterinary, Govt. of Meghalaya

Table: Number of animal slaughtered in the district (000 nos.)

Sl.No.	**Category of animal slaughtered**	**Ri – Bhoi**	**Meghalaya**

		district	
1	Cattle	17.88	253.09
2	Buffalo	0.32	4.73
3	Pigs	18.01	238.18
4	Sheep and Goat	7.66	120.43
5	Poultry	246.93	3796.17

Source: Integrated Sample Survey – 2011 – 12, Directorate of Animal husbandry & Veterinary, Govt. of Meghalaya

Table: Total meat production in the district (in tones)

Sl. No.	Category of animal	Ri – Bhoi district	Meghalaya
1	Cattle	1567	22368
2	Buffalo	37	552
3	Pigs	762	10099
4	Sheep and Goat	70	1085
5	Poultry	264	4137
	Total	2700	38241

Source: Integrated Sample Survey – 2011 – 12, Directorate of Animal husbandry & Veterinary, Govt. of Meghalaya

Table: Total egg production (Lakhs number, 2011 – 12) in the district

Name of the district	Total egg		Annual production 2011 - 12	Annual production 2010 - 11	Percentage of increase
	Fowls	**Duck**			
Ri - Bhoi	121.14	2.27	123.41	120.75	2.20
State (Meghalaya)	990.41	30.23	1020.64	1011.41	0.91

Source: Integrated Sample Survey – 2011– 12, Directorate of Animal husbandry & Veterinary, Govt. of Meghalaya

FISHERIES

The Ri –Bhoi district of Meghalaya has unique topographical condition. Consequently the district is blessed with vast and varied water resources in the forms of rivers, reservoirs, beels, lakes, swamp, pond, mini barrages and low lying paddy. The district shared maximum 20% in total area of pond/mini barrages of the state followed by 10.2, 9.23 and 2.46% in case of reservoirs, rivers, and beels, lakes etc. respectively, but no contribution in state in terms of paddy cum fish culture in the district, although it is a proven technology scope and potential of ornamental fish (Puntius bartis sp) is not so much satisfactory.

Table: Fisheries resources of the district

Sl. No.	Resources	State	District	% share of district
1	River stream (km)	5600.0	511	9.12
2	Reservoirs (ha)	8430.0	650.0	7.71
3	Beels, Lakes and Swamps (ha)	375.0	9.24	2.46
4	Pond/Tanks (ha)	500.0	239.86	47.97
5	Paddy cum fish culture	85.0	-	-
Total		14,990.00	1410.10	

Statistical Handbook 2011 Ri Bhoi District, GoI, Office of the District Statistical Officer

Table: Distribution of area and nos. of pond at Government fish farm

Sl. No.	Name of the govt. fish farm and its area (ha)	Types of pond	Functioning		Non functioning		Total	
			No.	Water area (ha)	No.	Water area (ha)	No.	Water area (ha)
1	Umsning fish farm (3.672 ha)	Stocking	1	0.05	1	0.42	2	0.47
		Reared	4	0.73	-	-	4	0.73
		Nursery	3	0.04	9	0.12	12	0.16
		Total A	8	0.82	10	0.54	18	1.36
2	Kyrdem kulai	Stocking	2	0.13	1	0.06	3	0.19

	fish farm (1.63 ha)	Reared	1	0.06	-	-	1	0.06
		Nursery	-	-	6	0.09	6	0.09
		Total B	3	0.19	7	0.15	10	0.34
Total (A+B)			11	1.01	17	0.69	28	1.7

Table: Fishery status of district

Total water area available for fisheries	**1486.24 ha**
Fish production (2009 – 2010)	898.670 Ton/year
Fish requirement (as per projected population up to 2011)	2700 Ton/year
Deficit	1750 ton/year
Production potential	1398 ton/year
Per capita consumption	6 kg
Desirable	12 kg

Home Science

Women as Agriculture Workers in Ri-Bhoi District

Women are an important half of the society and in rural areas majority of women are labourers in agriculture. These women have dual responsibility of shouldering the household chores and contributing to the family income. They work for many hours a day but even then they acquire a secondary status in social life, economic activities and decision-making. The rural woman has limited access to resources and simultaneously lack control over income, credit, land, education, training and information. Many of the rural women are illiterate and this again makes them unaware about their rights and privileges and also forces them to face multiplex difficulties related to health, hygiene and nutrition. Generally the rural women are fully engaged in agriculture and allied activities including crop production, livestock management and post harvest handling of agricultural produce.

Nutritional status of women

Food consumption of rural woman is mainly affected by the availability of agri-commodities, income, family composition, habit and tradition. The intake of cereals

products such as rice and whole wheat is very high among the farmwomen but intake of rice products in the form of local snacks such as pu- maloi, pu- tharo etc are higher among them. The intake of pulses, vegetables and fruits were lower than the recommended amounts. Most of the women especially those in the child bearing stage suffer mostly from anemia and other nutritional deficiency which resulted in poor health due to imbalanced intake of food.

Activities of Farmwomen

The Farmwomen are mostly engaged in household chores and taking care of the children's, agriculture, livestock management and other activities such as basket making, processing of farm products etc. Many of the farmwomen are also involved in the activities of some Farmers club, Ladies club or under some SHG's where they are presently a member.

Future Scope

i. Training to upgrade their knowledge and skill as many of the farm women are interested in attending training programmes.
ii. Vocational training (scientific and technical) in agricultural activities, livestock Management, food processing and rural handicrafts in order to make them self reliant And independent.
iii. Impart nutrition health and childcare education for development of rural women.
iv. Make them aware of their rights and privileges.
v. Setting up of crèches.

Nutritional Status of children In Ribhoi District

The Nutrition of Infants and young children is very important, as they are more vulnerable to Malnutrition. Rapid growth and development of the body during this period calls for the need for increased nutritional requirements as compared to adults. Ribhoi district mainly has 3 blocks Umsning, Umling and Jirang and these three blocks has been taken up by the ICDS Under State Social Welfare Office for the purpose of supplementing nutritious foods for the children's from 0-5yrs of age, and for pregnant

and lactating women. Many numbers of Anganwadi center has been set up under the care of the anganwadi workers at grass root who performed all the distribution works as well as maintainance of the foodstuffs as well as reporting to the higher level. NSS (Nutritional Surveillance System) under NIN (National Institute of Nutrition), Hyderabad is being done on quarterly basis by the supervisors under the guidance of the CDPO (child development project Officer).

As per the NSS reports it was found that many of the children under Ri-Bhoi district still suffer from Under nutrition due to lack of various nutrients in the body.

Total number of children taken under ICDS is 13469 and out of this the total number of children weighed is 11305 (84%) and out of this it was found that the children who are classified as normal is 64.5% and 35.5% suffers from malnutrition and has been graded as follows:

i. Grade I Children- 30%
ii. Grade II Children-5.4%
iii. Grade III Children-0.1%

Children's who has been classed under Grade I, II, and III are the children sufferings from under weight and other deficiency of various nutrients such as calories, proteins, vitamins and minerals.(As per Report from The District Programme Officer,ICDS,East Khasi Hills, Dept Of Social Welfare, Govt of Meghalaya).

The major reason for Malnutrition is due to poverty, lack of knowledge of the mother, Improper post natal Care of the mother, unhygienic living conditions, low birth weight, wrong eating habits etc are mainly responsible for malnutrition of children. Proper feeding, adequate in quality and quantity is most important during infancy and childhood. Infant feeding comprises of breast feeding and complementary feeding. Although breast-feeding is being practiced in the whole district but it is not followed in its right perspective's and children are being fed solid foods even at the tender age of two months which is against the norm set up for infant feeding as certified by the World Health Assembly 54.2, is that infant should be given exclusive breast feeding for the first

six months of life and thereafter home based complementary foods should be given while continuing breast feeding up to 2 yrs of age. These norms are applicable to all sections of society as a public health recommendation.

CHAPTER- III CONSTRAINTS IN AGRICULTURAL PRODUCTION

CROPS

Sl. No.	Crop	Constraint
Agriculture		
1.	Rainfed Sali Paddy	i. Untimely occurrence of Monsoon ii. Unpredictable weather conditions (Almost every year facing this problems where paddy crops are damaged by drought like situation flash floods, hailstorms etc during Paddy cultivation which greatly reduces the yield of Paddy production iii. High pest attack at milking stage iv. Problems with fertilizers (costly cannot afford)
2.	Winter Paddy	i. No irrigation and problems with fertilizers (costly cannot afford) ii. Areas for Paddy cultivation reduce year by years due to non availability of irrigation facilities iii. Non-availability of HYV for late planting (Sept-Oct)
3.	Maize	i. Unaware of existence of package of practice ii. Unaware of the significance of inter cropping system iii. Lack of good market
4.	Soybean	i. Unaware of existence of package of practice
5.	Groundnut	i. Unaware of existence of package of practice ii. Groundnut cultivation
Horticulture		

6.	Citrus	i. Heavy and long dry spells of rain ii. Soil erosion due to cultivation on 60-70% sloppy land iii. Malnutrition iv. Acidic soil v. Wide spread zinc deficiency vi. No control against disease and pest with special reference to tristeza and greening
7.	Arecanut and tea	i. Bud rot disease

LIVESTOCK

Sl. No.	Animal	Constraints
1.	Pig production	i. Very poor growth rate of non-descript indigenous pig, which constitutes more than 80% of pig population. ii. Non availability of superior quality breeding piglets iii. Inadequate availability of quality feed at economic price. iv. Lack of scientific knowledge on improved pig production v. Inadequate facility of veterinary services and extension services vi. Absence of well organized marketing system vii. Lack of scientific slaughterhouse, processing and storage of pork products.

2.	Poultry production	i. Inadequate availability of superior variety of birds suitable for rearing under backyard. ii. Very poor production performance of desi/local birds iii. High cost of poultry feed iv. High mortality of poultry v. Traditional and unscientific system of poultry rearing. vi. Improper veterinary and extension services
3.	Dairy production	i. Very low milk yield of non descript indigenous cattle ii. Inadequate availability of superior germ plasm iii. Traditional system of dairy farming iv. High cost of concentrate feed and inadequate availability of green fodder v. Improper health care of cattle vi. Improper veterinary extension services vii. Lack of organized marketing system, processing and storage unit of dairy

FISHERIES

Sl. No.	**Constraints**
1	Lack of machineries, equipments, landless the fish seed production in the farm
2	High mortality in fingerling distribution due to lack of transportation facility towards for flung
3	Losses due to unexpected heavy rain resulting flood
4	Financial problem
5	Lack of training center
6	Lack of awareness of paddy cum fish culture

Home Science

Sl. No.	Constraints
1.	Occurrence of Malnutrition and other deficiency diseases in children and women.
2.	SHG'S without any proper objectives and activities due to lack of knowledge
3.	Post harvest losses
4.	Lack of knowledge in preservation and processing of various fruits and Vegetables, and utilization of available resources
5.	Lack of Income generation activities among the farmwomen
6.	Unawareness of nutrition and proper childcare practices among the women
7.	Unavailability of creches for children where they can leave while they are at work
8.	Lack of knowledge in different kinds of rural crafts that helps in income generation
9.	Unawareness of their rights and privileges
10.	Poverty and lack of proper education
11.	Lack of employment opportunities
12.	Poor decision-making
13.	Unreached welfare programme

CHAPTER- IV INSTITUTIONAL SUPPORT FOR AGRICULTURAL DEVELOPMENT OF THE DISTRICT

CROPS

1. Department of agriculture: Office of the District Agriculture Officer

The Office of the District Agriculture Officer, Nongpoh was set up as a branch of the Directorate of Agriculture, Government of Meghalaya to implement the state and central sponsored programs and schemes relating to development of Agriculture within the Ri-Bhoi District. The District Agriculture Office was created in 1992 when Ri-Bhoi District came into existence. The public authority is also responsible for the formulation of such schemes and programs, by harnessing the potentialities of both human and natural resources, and, through participation of the farming communities in implementation to achieve its objective.

Address of the main office: Office of The District Agriculture Officer Ri- Bhoi District, Saiden, Nongpoh.

The Office of the District Agriculture Officer, Nongpoh has the following branches in the district:

i. Office of the Agricultural Inspector Bhoirymbong, B.P. O. Bhoirymbong.

ii. Office of the Agriculture Inspector Jirang, Patharkhmah. B.P.O. Patharkhmah.

iii. Agriculture Extension Officer C\O Block Development Officer Umsning C&Rd Block, Umsning.

iv. Agriculture Extension Officer C\O Block Development Officer Umling C& Rd Block, Umling.

Office Hours: Summers: Opening – 10.00 Am closing – 5.00 Pm.

Winters: Opening – 10.00 Am closing – 4.30 Pm

2. Krishi Vigyan Kendra (KVK):

Krishi Vigyan Kendra is an innovative science based institution associated with assessment and refinement of latest agricultural technology to the farming community. KVK Ri-Bhoi was established on the 3rd Sept, 2002 under the administrative control of the ICAR Complex for NEH Region, Barapani, Meghalaya. It is located 35 km away from the District H.Q and 20 km from state capital Shillong. The prime goal of KVK, is to impart vocational trainings, tailoring to the needs, interest of the client groups as well as resource availability. The basic principle to be followed is "learning by doing" and "seeing is believing". The objectives of the training programmes are to enable farmers, farm women and farm youths including school dropouts in the rural areas to be self dependent through various income generating activities. The contents and methods of training programmes are flexible in nature, as it depends on Participant's socio-economic, educational and resource background. Moreover, efficacies of KVKs are further accelerated by other programmes like On Farm Testing and Front Line Demonstrations on major agricultural technologies.

Mandates:

i. Organising short and long term vocational trainings in agriculture and allied sector for farmers and Rural Youths with emphasis on "learning by doing" for generating self employment.
ii. Organising FLDs in Oilseeds and Pulses to generate production data and feedback information.
iii. Organising training to update the extension personnel within the area of operation with emerging advances in agricultural research on regular basis.
iv. Conducting On Farm Testing for identifying technologies in terms of location specific sustainable land use system.

Programmes:

1) Training programmes

Home Science

i. Nutrition Gardening
ii. Kitchen gardening
iii. Value addition of sohphie
iv. Drudgery reduction using farm implements
v. Value addition of maize
vi. Value addition of pineapple
vii. Water purification
viii. Compost pit – kitchen waste
ix. Packaging of food products
x. Packaging techniques
xi. Processing of value addition of bamboo shoot
xii. Zero energy cool storage
xiii. Storage of fruits and vegetables
xiv. Drudgery reduction
xv. Food Processing (Fruits and vegetables)
xvi. Groundnut Decorticator
xvii. Value addition of oranges
xviii. Training programme on tamarind rice mix preparation
xix. Training on value addition of Ginger

Plant Protection

i. Preparation of Bordeaux Mixture
ii. Management of Soft Rot of ginger with biopesticide
iii. Management of blast disease of rice in drought condition
iv. Training programme on ‘Mushroom Cultivation’
v. Management of fruitfly in guava through ME trap
vi. Biological control of stem borer of rice
vii. Biological control of downy mildew of cole crops in nursery bed

viii. Biological control of cabbage butterfly with Tricho card
ix. Cultivation of winter mushroom
x. Training on management of leaf blotch of Turmeric
xi. Training on management of soft rot of ginger with biopesticide
xii. Training on management of leaf blotch of turmeric
xiii. Management of downy mildew of Cole crop in nursery bed with Biopesticide

Agronomy

i. Harvesting of rain water through Jalkund
ii. Recycling of organic matter - Vermicomposting
iii. Package and practices for growing HYV of paddy
iv. Intercropping System
v. Package and practices for growing HYV of groundnut (var. ICGS-76)
vi. Package and practices for growing HYV of soybean
vii. Package of practices for growing HYV of Blackgram
viii. Management of diseases of rice through SRI
ix. Package and practices for growing HYV of mustard var. TS – 38
x. Soil Health Kit
xi. Package and practices for growing HYV of pea
xii. Training on package and practices for growing HYV of Blackgram
xiii. Training on weed management on rice and seed storage sponsored by IRRI, IFAD

Horticulture

i. Nursery production of winter vegetables
ii. Management of Polyhouse
iii. Nursery preparation of winter vegetables
iv. Land preparation, sowing and intercultural operations in turmeric
v. Package of practices for growing of French bean
vi. Package of practices for growing of cowpea
vii. Site selection, layout and intercultural operations in Khasi mandarin
viii. Transplanting and intercultural operations in brinjal

ix. Concept and layout of kitchen garden
x. Nursery raising techniques of cabbage
xi. Cultivation of cabbage as a remunerative crop
xii. Method of storage of turmeric rhizome
xiii. Protected cultivation of capsicum
xiv. Mulching of broccoli, cauliflower

Animal Science and Fishery

i. Improved health care of poultry, duck, goat & pig
ii. Training on improved health care practices of pig
iii. Training cum Awareness Programme on National Initiative of fodder technology Demonstration
iv. Scientific goat farming
v. Improved fodder production for dairy cows
vi. Housing, feeding , breeding and management of goat farming
vii. Management of feeds and fodder for feeding of dairy cows
viii. Scientific backyard poultry farming
ix. Enhancement of nutritive value of rice polish based ration through supplementation of phytase
x. Improved management method for pig farmers
xi. Improved methods for poultry farming
xii. Improved housing system for pig farming
xiii. Scientific pig farming
xiv. Training programme on integrated duck cum fish farming
xv. Collaborative Training programme on improved management practices for pig and poultry production and composite fish culture system (2 days training)
xvi. Training programme on up gradation of local goat through introduction of improved germ plasm
xvii. Training composite fish culture technology (Netting)
xviii. Training on integrated farming system (duck cum fish)Training programme on rearing of carp fry
xix. Training programme on composite fish culture technology

xx. Training on Livestock based integrated farming system for veterinary field assistants of Ri Bhoi District

Others

i. Training programme on Bee Keeping in Collaboration with KVIC
ii. Promotion of self employment through farm based activities (by District Agricultural Office)
iii. Common problems of SHG members and their solutions
iv. News paper coverage
v. Soil & Plant Analysis

2) Front line demonstration

To demonstrate the productive potential of newly released technologies to farmers' conditions. To get first hand feedback on the contributory or limiting factors for achieving the productive potential of the new technology. Frontline demonstrations are conducted under the close supervision of the Subject Matter Specialist.

3) On farm testing

On farm testing is conducted to test and evaluate the research findings of Research Stations at the farmer's field and to refine and modify the technologies, if required for better adoption by farmers. It is confirmation of already proven research results under real farming situation.

4) Farm advisory services

The Kendra organizes field visits regularly to assess the field problems and to give remedial measures. The farmers are also encouraged to use telephone and mobile phones to contact the centre for immediate solution to their problems.

5) Exposure visits

The centre also organizes tours for farmers to various research centres and fields of progressive farmers for 'seeing and studying' and to motivate them in their work.

6) Farmer's visit to the Kendra

Farmers are encouraged to visit the Kendra in person to discuss and solve their specific field problems and to get hands-on knowledge on the latest technologies available in agriculture and allied fields.

7) Exhibitions, Kisan Melas etc.

The KVK also participates in different programmes like Exhibitions, Kisan Melas etc to showcase the different activities that are being done. Farmers are also encouraged to attend these shows to avail the benefits.

8) Other extension activities

i. Field Days
ii. Kisan Gosthis
iii. Diagnostic visit
iv. Scientist visit to farmer`s field
v. Vaccination camp
vi. AI of pig
vii. Soil health camp
viii. Method demonstration
ix. Group discussion
x. Advisory /helpline service
xi. Extension literatures developed
    a. Technical bulletin
    b. Research Publication
    c. Popular article
    d. Folders
    e. Leaflets
xii. Radio Talk
xiii. TV Programme

xiv. Lecture delivered

Address for communication:

Programme Coordinator
KVK Ri Bhoi
ICAR RC for NEH Region, Umiam
Meghalaya
Phone no. 0364 – 2570011
Website: kvkribhoi.nic.in
Mail: pckvkribhoi@gmail.com

3. Agricultural Technology Management Agency (ATMA):

ATMA is a society of key stakeholders involved in agricultural activities for sustainable agriculture development in the district. It is a focal point for integrating Research and Extension activities and decentralizing day-to- day management of the public Agricultural Technology System (ATS). It is a registered society responsible for technology dissemination at the district level. As a whole the ATMA would be a facilitating agency rather than implementing Agency. The funds allotted for ATMA includes Establishment of ATMA office at district headquarters, strengthening of line departments by providing infrastructural facilities, establishing FIACs. The ATMA will not encourage any practice or program which; the line departments were already initiated. With the minimum budget, ATMA can introduce or demonstrate some of the programs as innovative model, which can be replicated by farmers' organizations.

The ATMA at district level would be increasingly responsible for all technology dissemination activities at the district level. It would have linkage with all the line departments, research organization, non-governmental organizations and agencies associated with agricultural development in the district. Research and Extension units within the project district such as ZRS or substations, KVK and the key line departments of Agriculture, Animal Husbandry, Horticulture and Fisheries, Forestry etc. would

become constituent members of ATMA. Each Research-Extension (R-E) unit would retain its institutional identity and affiliation but program and procedures concerning district-wise R-E activities would be determined by ATMA Governing Board (GB).

The objectives of ATMA are:

i. To strengthen research – extension – farmer linkages
ii. To provide an effective mechanism for co-ordination and management of activities of different agencies involved in technology adaption / validation and dissemination at the district level and below.
iii. To increase the quality and type of technologies being disseminated.
iv. To move towards shared ownership of the agricultural technology system by key shareholders.
v. To develop new partnerships with the private institutions including NGOs.

Salient Features of ATMA:

i. Creating Farmer Advisory Committee to improve feedback.
ii. Using NGOs to organize farmers.
iii. Encouraging private sector involvement in technology transfer.
iv. Validation and refining technologies through research units in the district.
v. Bottom up planning procedure.
vi. Increased use of Information Technology (ARIS, WWW)
vii. In-service training to increase staff competence.
viii. Developing new Public-Private partnerships.
ix. Formation and strengthening of farmer's interest group

Address for communication:

Project Director, ATMA
District Agriculture Officer, Nongpoh,
Ri Bhoi, Meghalaya
0364-2232716 (o) 9436111992

agrirb-meg@nic.in

4. Lead Bank

The Lead Bank Scheme provides leadership in initiating, streamlining and accelerating the process of development of the respective district by enlisting the co-operation of other banks and by maintaining continuous liaison with Government and quasi Government agencies. The State Bank of India functions as the lead bank in Ri Bhoi district as well as in the state of Meghalaya.

5. Other banking institutions

All nationalized banks in the district have special schemes for the promotion of agriculture and allied fields in the district.

6. Farmers clubs and voluntary organizations

There are a few SHGs, farmer's club, women's club working in the areas of agriculture and allied activities.

7. Polytechnic colleges and vocational higher secondary schools

Union Christian College - An Educational Project of North East India Christian Council (NEICC), is situated in Umiam, Ri Bhoi. The number of Preprimary and Pre-Basic is 277, Primary and Junior Basic is 277, Middle and Senior Basic is 105, High/Higher Secondary is 31. Teacher Training/ Basic & Non-basic is 1 and Schools for Vocational/ Professional/Special & Other Education including Adult Education is 1.

8. Rural Resource and Training Centre (RRTC)

Rural Resource and Training Centre (RRTC) reaches out all the tribes of Northeast India especially to school dropouts and farmers. RRTC has a rich experience in working with rural poor, especially by providing skills training in the organic farming, livestock management, agriculture low-cost and appropriate technology and entrepreneurship. The centre is perched on a hillock surrounded by a lush-green model farm of 175 ha.

With farm models (homestead farming, horticulture, floriculture, fishery, herbal garden, dairy, poultry, piggery and food processing), a rural technology park, scout camps and a well managed Training Centre with a capacity of over 200 participants. The visitors, who come mainly for training and exposure, comprise of youth, women and men farmers, young entrepreneurs, school and college students and government officers from all eight states of Northeast India, numbering up to 5000 annually. RRTC is known for its agricultural extension services and rural development projects in South Garo Hills and Jaintia Hills, Ri Bhoi District of Meghalaya.

9. State Institute for Rural Development (SIRD)

The State Institute of Rural Development (SIRD) of Meghalaya was established in the year 1986 out of the grant received from the European Economic Community (EEC) Aid Programme and is supported by the Ministry of Rural Development, Government of India (MoRD-GOI), and Government of Meghalaya (GOM). The new campus was inaugurated on 6th September 1989. The SIRD, Meghalaya was notified as the Apex Level Training Institute in Rural Development of the Government of Meghalaya in the year 1994. It was registered in 1991 under the Societies Registration Act 1960 and thereafter, the SIRD Meghalaya functions as an autonomous organization under the Department of Community and Rural Development, Government of Meghalaya.

Functions:

Capacity building, training, research and consultancy services are the core functions of the Institute. At present the focus of training is on capacity building of development functionaries, both officials and non-officials who are involved in the implementation of flagship programmes of the Ministry of Rural Development (MoRD) and the Ministry of Panchayati Raj (MoPR). These programmes are carried out as training courses, workshops, seminars and conferences.

Target group

A. Government Officials

i. Officials' functionaries from the state, district, block and village levels.
ii. Master Trainers and Trainers of Institutions.

B. Non-Officials

i. Elected PRIs (VEC/AEC/MLAs/MDCs) at the district and block level.
ii. Volunteers of NGOs.
iii. Members of SHGs.
iv. Bharat Nirman Volunteers (BNVs).
v. Members of Vigilance and Monitoring Committee (VMCs).
vi. Members of Social Audit Committees.
vii. Employees of Public Sector Units (PSUs) like Banks and other commercial organizations.
viii. Representatives from Universities and colleges.
ix. Master Trainers.
x. National Youth Corps (NYC).

Areas of training

i. Mahatma Gandhi national Rural Employment Guarantee Scheme (MGNREGS)
ii. Backward Regional Grant Fund (BRGF)
iii. Lab to Land Initiative
iv. Total Sanitation Campaign (TSC)
v. Integrated Watershed Management Programme (IWMP)
vi. Indira Awaas Yojana (IAY)
vii. National Social Assistance Programme (NSAP)
viii. National Rural Livelihood Mission (NRLM)
ix. National Rural Health Mission (NRHM)
x. Integrated Child Development Scheme (ICDS)

xi. Food Adulteration and Food Safety Management
xii. Information and Communication Technology (ICT)
xiii. Land Management and Administration
xiv. Socio-Economic Caste Census (SECC)
xv. Disaster Management
xvi. Entrepreneurship Development

x. Meghalaya Non-Conventional And Rural Energy Development Agency (MNREDA)

Meghalaya Non-Conventional and Rural Energy Development Agency was set-up on 14.09.87 as a State Nodal Agency for the Ministry of New and Renewable Energy Sources, Govt. of India. The Agency was registered under the Meghalaya Societies Registration Act 12 of 1983. The aims and objective of the Agency is to formulate and implement demonstration, experimental, promotional and extension projects and programmes related to New and Renewables Energy such as Solar-Energy, Wind Energy, Biogas, Biomass, Micro/ Mini/ small Hydro Power, Watermill, Co-generation (non-Bagasse). The programme covers, providing electricity to remote unelectrified rural areas of the state.

LIVESTOCK

1. Department of Veterinary and Animal Husbandry

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.

To bring about a developmental change in livestock and poultry sector, number of programmes and infrastructure development were undertaken by the Government where the activities of the Department were mainly centered round the following broad objectives: -

i. Providing protection to livestock and poultry from the ravages of diseases through treatments and preventive vaccinations.
ii. Introducing improved breeding techniques for upgrading the local stock.
iii. Ensuring better Animal Husbandry practices through adoption of Extension and Research.
iv. Building up of adequate technical and professional man-power through Education and Training.
v. Encouraging setting of Livestock and Poultry Industries.

There are 15 veterinary dispensaries, 2 veterinary aid centres and 1 mobile veterinary dispensary in the district. There are 12 Stockman Centre (with AI facilities), 11 Stockman Centre (without AI facilities), 2 Veterinary Institutions (with A.I. facilities), 1 check post, 1 cattle breeding farm, 3 poultry farm, 1 pig farm, 1 fodder and seed production farm, 1 feed mill and 1 vocational training centre.

Address for communication:

District Veterinary Officer
Nongpoh, Ri Bhoi
Meghalaya

FISHERIES

1. Department of Fisheries:

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 for fish production. 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.

Address for communication:

District Fisheries Officer
Nongpoh, Ri Bhoi
Meghalaya
Ph. No. 03638 232552

SERICULTURE

1. Department of Sericulture and Weaving

The Directorate of Sericulture and Weaving is under the Direct and Administrative control of the Sericulture and Weaving Department. It is already in existence since the time of erstwhile Government of Assam. Consequent upon the bifurcation of State in 1972, the Department continues with the activities.

Sericulture and Weaving are two important Cottage Industries, which play a vital role for uplifting the economy of the State. The main objective is to provide self-employment to rural people and improve their income through developmental programmes.

Address for communication:

District Sericulture Officer,
Nongpoh – 793102
Meghalaya
Phone (O):953638 232824

CHAPTER- V RESEARCH AND DEVELOPMENT ORGANIZATIONS RELEVANT TO DISTRICT'S AGRICULTURE

ICAR Research Complex for North Eastern Hill Region:

ICAR Research Complex for North Eastern Hill Region was established in the year 1975 by the Indian Council of Agricultural Research to provide an adequate research base for supporting agricultural development in the North Eastern Hill region of the country. It is the first institute of its kind setup by ICAR which encompasses all the disciplines of agriculture, horticulture, animal sciences, agricultural engineering, agro forestry and fishery to cater to the research needs of the tribal areas of NEH Region.

Mandate of the Institute:

i. Development of sustainable farming systems for different agro-climatic and socio-economic zones of the region
ii. Improvement in the productivity of different crops, live stocks and aquatic fauna through the development / screening of varieties and agro-techniques
iii. Improvement in rain-fed agriculture through watershed based approach
iv. Development of local competence through training on agriculture and allied sectors
v. Development of effective linkages with other development departments, financing agencies and SAUs / CAUs operating in the region
vi. To maintain database and act as a repository of information centre on agriculture and allied sectors and to provide consultancy in the above areas including plant and animal bio-technology
vii. Germplasm exchange, research update in a collaborative mode with other national and international agencies

Research Agenda

i. Farming systems research and agro-forestry interventions through water shed based approach
ii. Development and screening of suitable crop varieties

iii. Development of efficient cropping systems
iv. Soil and nutrient management
v. Development of technologies for organic food production
vi. Diseases and pest management
vii. Improvement of fruits, vegetables and spices including floriculture and hi-tech horticulture
viii. Soil and water conservation
ix. Farm mechanization
x. Post harvest technology
xi. Rodent management
xii. Improvement of important livestock and poultry
xiii. Development of animal health cover measures
xiv. Development of aquaculture in hills
xv. Molecular genetic studies in IPR perspective
xvi. Testing and refinement of evolved technologies at farmers' field and their dissemination
xvii. Use of Information Technology in Agriculture and also market intelligence

Address for communication:

Director of ICAR RC for NEH Region, Umiam
Barapani, Ri Bhoi District
Meghalaya
Pin - 793 103
Email: icarneh@gmail.com
Phone (0364) 2570257
Fax (0364) 2570355

CHAPTER- VI PLANS AND SCHEMES FOR PROMOTION OF AGRICULTURE

There are several plans and schemes under different organizations for promotion of agriculture, livestock and fisheries in the district.

CROPS

1. National Bank for Agriculture and Rural Development (NABARD):

The National Bank for Agriculture and Rural Development (NABARD) came into existence on 12 July 1982 by transferring the agricultural credit functions of RBI and refinance functions of the then Agricultural Refinance and Development Corporation (ARDC). NABARD was dedicated to the service of the nation by the late Prime Minister Smt. Indira Gandhi on 05 November 1982. Its mission is to promote sustainable and equitable agriculture and rural prosperity through effective credit support, related services, institution development and other innovative initiatives.

a. Dairy Entrepreneurship Development Scheme (DEDS)

Objectives

i. To generate self-employment and provide infrastructure for dairy sector
ii. To set up modern dairy farms and infrastructure for production of clean milk
iii. To encourage heifer calf rearing for conservation and development of good breeding stock
iv. To bring structural changes in the unorganized sector, so that initial processing of milk can be taken up at the village level, to upgrade traditional technology to handle milk on a commercial scale
v. To provide value addition to milk through processing and production of milk products.

b. Comprehensive Package For The Handloom Sector

The components of the scheme are as under:

i. Interest Subsidy – To provide subsidized loan to handloom sector at the interest rate of 6% for a period of three years, the quantum of interest subsidy to be borne by the Government of India will be for three years and limited to the differences between the actual rate of interest as applicable and charged by the Banks and 6% which is to be borne by the borrower.

ii. Margin Money assistance @ 20% of the project cost subject to a maximum of Rs.10,000/- per weavers will be provided which will enable the handloom weavers, their Self Help Groups and Joint Liability Groups to leverage this amount for borrowing loans from the banks.

iii. The Interest Subsidy and Margin Money is routed through NABARD.

2. Directorate of Agriculture, Meghalaya

a. Agricultural schemes

State plan schemes:

i. Implementation of e -Governance

To usher a conducive environment for transformation of the departments core services delivery systems and to facilitate better citizen friendly services

ii. Seed Farm - Production of Cereals, Pulses, Oilseeds etc

Focused and high quality seed production of cereals, pulses and oilseeds etc

iii. Bio Control Laboratory

Aim to control pests and diseases including weeds and rodents through bio control agents.

iv. Integrated Farming in Micro Watershed

To promote integrated farming activities for improved livelihood in complementary manner

v. State Soil Survey

To survey and prepare block wise soil fertility map of the State through soil sample collection, soil analysis and soil mapping.

vi. Training of Rural Educated Youth for Self Employment in Farm Based Activities.(TREYSEFA)

Scheme is to open opportunities for rural educated unemployed youths to take up agriculture as an enterprise for gainful employment.

vii. Agriculture Academic Studies

Sponsoring of seat for undergoing 4 years degree course in Agriculture/ Horticulture.

viii. Winter Cropping and Development of Cultivable Land

Aims at area expansion of Cereal, Pulses, oilseeds, and vegetables during Rabi season.

ix. Seed Testing Lab and Seed Certification

To provide seed testing services for farmers and establishment of seed certification lab.

x. Soil Testing Lab

For analyzing soil samples preceding application of fertilizer in correct dosage in farmers field

xi. Plant Protection including IPM

Aim to Control Pests and diseases including weeds and rodents

xii. Special Development Programme for Areas Bordering Assam

To uplift small and marginal farmers residing in areas bordering Assam with suitable crop enterprises.

xiii. Maize Development through Cluster Approach

To achieve notable increase in Maize production by adopting crop and location specific production technology.

xiv. Agriculture Information Unit

To strengthen agriculture extension programme by disseminating news on the latest scientific and farmer friendly methods of cultivation.

xv. Farmers Training Institute

Farmers Training Institute - FTI conduct specialized training in new areas where farmers were hitherto unaware including conducting exposure visit and field tours to agriculturally advanced States.

xvi. Jute Technology Mission

To supply quality seeds to farmers at 50% subsidy and to take up demonstration programmes on jute.

xvii. Agriculture Engineering (Mechanical)

To provide hiring of power tillers and paddy reapers to farmers at 50% subsidy.

xviii. State Rice Mission

Increase rice production and productivity in the state to meet the consumption requirement and to bridge the deficit between demand and availability to consumers.

Centrally sponsored schemes:

i. National Food Security Mission (NFSM)

Increasing production of rice, pulses and coarse cereals through area expansion and productivity enhancement in a sustainable manner, restoring soil fertility and productivity at the individual farm level and enhancing farm level economy and profits to restore confidence amongst the farmers

ii. National Project on Management of Soil Health and Fertility.

Strengthening of soil testing laboratories, promoting balance use of fertilizer and integrated nutrient management

iii. Research Project on Rice (AICRIP)

To conduct adaptive trials / experiments specially on paddy at different agro-zones involving farmers. Experimental research studies are also carried out at farmers' field involving different locations and altitudes. Farmers are also trained in the safe use of inputs, fertilizers, pesticides etc.

iv. National Watershed Development Project for Rainfed Area (NWDPRA)

The main objective of the scheme are :- i) Conservation, development and sustainable management of natural resources. ii) Enhancement of agricultural production and productivity in a sustainable manner. iii) Restoration of ecological balance in the degraded and fragile rainfed ecosystems by greening these areas through appropriate mix of trees, shrubs and grasses. iv) Reduction in regional disparity between irrigated and rainfed areas and v) Creation of sustained employment opportunities for the rural community including the landless.

v. Special Jute Development Programme.

The objective of the scheme is to increase the production and productivity of jute in the State including qualitative improvement of jute fibre.

vi. Integrated Pest Management (IPM)

The scheme aims to popularise Integrated Pest Management (IPM) approach among farming community to promote use of bio pesticides by imparting training to master trainers, extension workers and farmers. Scheme is implemented in 21 States and one Union Territory with 26 Centres.

vii. Support to State Extension Programme for Extension Reforms (ATMA)

Providing autonomous institutions at the state, district and block level. Adopting group approach, addressing gender concerns, convergence with allied sectors through an integrated and broad based delivery system.

Central sector schemes

i. Agriculture census

Agricultural Census is the largest countrywide statistical quinquennial operation undertaken by Ministry of Agriculture, Govt. of India. Primary and secondary data on structure of Indian agriculture are collected under this operation using the machinery of the State governments. The first Agricultural Census in the country was conducted with reference year 1970-71. So far seven Agricultural Censuses have been completed at five yearly intervals and the eighth one is in operation in the country. The Census is carried out in three Phases.

2. b. Horticultural schemes

State plan schemes

i. Capacity Building of Departmental Personnel

The scheme aims to equip departmental officers and staffs with the latest technical knowhow and skills including upgrading knowledge in the field of horticulture.

ii. Grant in Aid to Agri and Horti Society

Promotion and popularization of floriculture and other horticulture activities in the State

iii. Establishment of Directorate of Horticulture (TFC)

To meet the infrastructural costs associated with up scaling horticultural development in the State.

iv. Organic Manures including Vermicompost and Compost Pit

To affirm that vermiculture, vermicompost and composting of organic matters are viable alternative manures to chemical fertilizers and to motivate farmers in this line. Field trials of availability recycled organic manures are give priority.

v. Plant Protection including IPM

Aim to Control Pests and diseases including weeds and rodents of horticultural crops by distribution of pesticides and equipments at 50 percent subsidy.

Plantation Development (Areacanut, Cashewnut, Coconut)

To provide financial assistance to the farmers, 33 percent subsidy for purchasing of planting materials, polypipes. Financial assistance at 50 percent subsidy for construction of Areacanut bookage tank.

vi. Spices Development - Ginger, Turmeric, Black Pepper, Cardamom, Coriander, Cinnamon and Chillies

To assist spice growers by distribution of quality planting materials, plant protection chemicals including tools and implements at 50% subsidy.

vii. Tuber Crops Development - Potato, Tapioca, Colocacia

To boost up production of potato by providing quality HYV seeds, chemicals and equipments at 50% subsidy. The Scheme also aims to popularized and encourage cultivation of tapioca, colocacia, sweet potato etc.

viii. Mushroom Development

To train farmers in the method of mushroom cultivation, to supply quality spawn and pasteurized compost to farmers.

ix. Tea Development

To continue experimental plantation of tea and to find the possibility of growing tea economically as well as in commercial scale. Seedlings are raised in the experimental station and distributed free to farmers.

x. Indigenous Crops Development

To identify and document indigenous plants and the areas where potential species of commercially viable varieties are abundant, domesticating and raising them in selected cultivators land or in Government run farms for research and multiplication programme.

xi. Marketing and Quality Control - Marketing Facilities

Collection and reporting of reliable and accurate data on market intelligence and market sentiments for important agricultural commodities in the state, to be utilised for formulation and implementation of agriculture price policies.

xii. Horticulture Information Scheme

To provide support to horticulture extension programmes through different media.

xiii. Vegetable Development Scheme

To promote vegetable production through HYV seeds and seedlings, including demonstration in farmer's field

xiv. Fruit Development Scheme

To boost the area and production of fruits through new plantation.

xv. Vegetable Garden Development Scheme

To make available nutritious crops to every household having available kitchen garden of more than 200 Sq. Metres area for cultivation of organic vegetables.

xvi. Floriculture Development Scheme

To boost the area and production of fruits through new plantation.

xvii. Development of Strawberry Cultivation

To provide farmers with quality and improved varieties of strawberry planting materials so as to encourage area expansion under this crop such that commercialization horticulture under this crop is achieved.

xviii. Integrated Basin Development (Horticulture)

To make available to the farmers good quality planting materials including other inputs with full package of practices.

xix. Post Harvest Marketing

Creation of post harvest marketing infrastructure.

xx. Fruit Processing

For utilization of surplus fruit and vegetables and conversion of the same to marketable processed products like jam, jelly, squashes, thereby creating a market for fruit growers.

xxi. Development and Maintenance of Orchard cum Horti Nurseries

For production and multiplication of good, high yielding, diseased free planting materials for distribution to farmers

Mission for Integrated development of Horticulture

i. Horticulture Mission for North Eastern Hill(HMNEH)

Improving productivity, quality planting material, canopy management of fruits tree, support to marginal and small farmers, up scaling protected cultivation and drip irrigation.

ii. National Horticulture Board (NHB)

To provide focus on development of commercial horticulture in the state List of plans and schemes of Government organizations, NGOs and farmers organizations of the concerned district related to crops may be included .

LIVESTOCK

1. **Direction and Administration**: This is to co-ordinate and supervises work in various sectors for development of Animal Husbandry in the State.
2. **Veterinary Services and Animal Health**: The object of the scheme is to render Veterinary Aid including preventive measures against deadly diseases from other State.
3. **Cattle Development**: This is an integrated programme of Cattle Development including breeding, management practices and marketing of milk.

i. **Intensive Cattle Development Project**: The object of the scheme is to grade up local cattle through Artificial Insemination programmes with exotic breed, such as, Jersey and Holstein-Friesian to increase milk production.

ii. **Regional Crossbred Cattle Breeding Farm, Kyrdemkulai** : The object of the scheme is (i) to support crossbreeding programmes in the State, (ii) to impart training to the farmers and field staff for management in cross bred cattle, (iii) to supply pure bred and cross bred breeding stock to other states in the Region, and, (iv) Supply of milk to the Central Dairy, Mawiong.

4. **Poultry Development**: The objective of the scheme is to meet the requirement of breeding stock, table and hatching eggs for the farmers as well as

popularise modern poultry and duck keeping amongst the farmers including training and extension services.

i. **District Poultry Farms**: The objective of the District Poultry Farms is to supply improved breeding stock to the farmers and create awareness amongst the rural people to take up poultry farming for egg production and broiler production for meat supply.

ii. **Regional Poultry Breeding Farm, Kyrdemkulai**: The objective of the scheme is (i) to produce improved chicks for distribution to all Government Poultry Farms/private commercial farms in the state for extension of poultry development programmes and supply of improved chicks to other States of North Eastern Region and (ii) to impart training to farmers in poultry breeding and management practices.

iii. **Broiler Farm, Kyrdemkulai**: The object of the scheme is (i) to produce broiler chicks for distribution to all District Govt. Poultry Farms/Private Farms and Farmers for rearing of broiler chicks to meet the demand of broiler meat in the State and (ii) to impart training to the farmers in feeding, management, disease control, marketing etc.

5. Piggery Development

i. **Regional Pig Breeding Farm, Kyrdemkulai**: The objective of the scheme is to supply improved breeding stock to the Government Pig Farms for multiplication to meet the requirement of breeding stock in the State.

6. Feed and Fodder Development

i. **Fodder Demonstration and Seed Production Farm** : The fodder farms and the fodder seed production farms have been established to meet the requirement of fodder in the Govt. Cattle Farms and to provide fodder seeds for different fodder farms of the State

ii. **Feed Milling Plants**: The objective of the scheme is to supply mixed feed to Government farms as well as to private breeders at competitive rate.

iii. **Feed Analytical Laboratory**: The objective of the scheme is to analyse feed ingredients and mixed feed of state Farms as well as those coming from other States/sources.

6. Administration, Investigation & Statistics

i. **Livestock Census**: The objective of the scheme is to take complete count of the Livestock and Poultry population once in every 5 years and to analyse and interpret the data with ultimate aim of releasing them for various uses by Government and public alike.

ii. **Sample Survey for Estimation of Major Livestock Products**: The objective of the scheme is to conduct Integrated Sample Survey for estimation of major livestock and poultry products, e.g., milk, meat and eggs and to study the utilization of livestock and poultry products and existing practices of utilization/marketing of such products in the State. This is done on regular basis throughout the year.

7. Education and Training

i. **Studies in Veterinary Science etc**: The objective of the schemes is to send local students for studying in the B.V.Sc. course outside the state and VFA Training School, Upper Shillong to meet the requirement of Technical Manpower.

ii. **Training of Officers/Workshop**: The objective of the scheme is to send the officers for training in specialized fields outside the State.

iii. **Vocational Training Centre**: The objective of the scheme is to impart short training to farmers/beneficiaries on proper management, feeding and health care of livestock and poultry.

8. Centrally Sponsored and Central Sector Schemes.

The Department is also implementing various Centrally Sponsored Schemes under different heads. The important schemes are:

i. Professional Efficiency Development.
ii. Assistance to State to Control Animal Disease (ASCAD)
iii. Rinderpest Surveillance and Containment Vaccination Programme
iv. Sample Survey of Major Livestock and Livestock Census
v. National Project for Cattle and Buffalo Breeding Programme
vi. Livestock Insurance Scheme.

FISHERIES

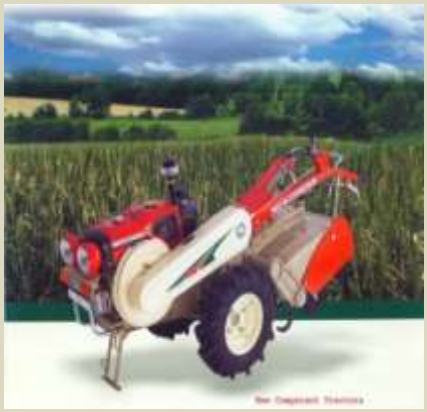
1. Meghalaya State Aquaculture Mission (MSAM)

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:

i. Development of existing water bodies and creation of additional water area for large scale fish production, including reclamation/rehabilitation of marshy and swampy lands,
ii. Conservation of native, endangered and traditional species of Meghalaya and developing breeding farms of commercially potential species on a large scale,
iii. 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,
iv. Capturing emerging opportunities in the fisheries sector.

CHAPTER- VII FARM MACHINERY SUITABLE TO THE DISTRICT

1. Power tiller



Power Tiller is also referred as walking tractor powered by 10 to 15 horse power (HP). It is a versatile machine which carries out all the function of tractor except that the operator has to walk behind the machine. Ideally suited for small farmers with popular usage are wet puddling, dry land cultivation, ridging, water pumping and spraying. It can also be coupled with a trailer that has a capacity of 1.5 tonnes for transportation. Tilling width: 600 mm maximum, No. of tynes: 18, Tilling depth: 150 mm maximum, Plough Depth: 220 mm maximum. Approximate cost is Rs. 1,50,000/-

2. Walk behind rice transplanter

This is a high labour saving machine, eliminates drudgery, increase productivity and gives very high return on investment.

Purpose : For transplanting mat type rice seedlings in puddled soil, in rows
Row to row : 30 cm (4 row)
Coverage : 1.4 ha/day
Cost : Rs. 1,45,000/-

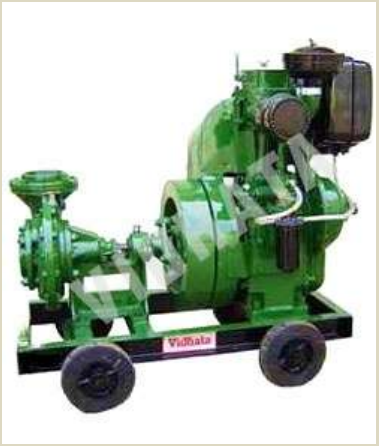
3. Aspee knap sack sprayer

This High Pressure Knapsack Sprayer is for outdoor work such as garden, vegetable plots or for crops. Total/Valid Capacity:16 litres, Gross Weight:3.5 kg, Box Dimensions:39.5 × 18 × 52.5 cm,Working Pressure:300-400 KPa, Minimum Discharge Rate:500 ml/min, Quantity per 20 ft. Container:700 PCS. The cost is Rs. 5000/-

4. Cono weeder

Weeding is the process of eliminating the competition of unwanted plants to the regular crops so that crops can be grown profitably. Management of weeds is an important component of production techniques as elimination of weeds is expensive and hard to achieve. Hymatic Cono Weeders are becoming popular because they are utilized under shallow water conditions. Weeds are uprooted by the teeth of the weeder and buried in the mud by push and pull operations of the weeder. Advantages: Buries the weed in the soil itself making it natural manure, facilitates good aeration for roots. Area of coverage – 0.18 ha/day; saving in labour = 50 percent; saving in cost = 40 percent of weeding. The cost is Rs. 1000/-

5. Diesel operated centrifugal pump (water pump):



These water pump set are used to lift water from deep well, lake, ponds, river etc for irrigation these type of pump set are used widely by thousands of Asian & African farmers as the pump and engine design are simple so they are long life and easy reparable and long lasting performance. Main feature was low RPM 1500 so those minimum wear & tear of spares. Engines (Hand Start or electric start optional) between 4 and 28 H.P Direct Coupled to Water Pumps, either Centrifugal or Self Priming Sets should be built on steel base. Stationery on the steel base, and

Portable using Rubber Wheels (Coasters), and handle in order to move the set from one place to another. The Engines of those sets are cooled automatically from the pumps, as the pumps send the cold water through a hose to the Cylinder head as an intake. The outlet side for warm water is the hopper cover. This way the engine is kept cool during the operation. The outlet water is not wasted, because it is used for irrigation also.

6. Adjustable row marker

It is suitable for marking rows at different spacing according to the crops to be sown. Sowing in rows facilitates intercultural operations like weeding, earthing, etc. in better way. Row spacing can be adjusted between 20 to 60 cm by sliding the tynes on a cross bar. The cost is Rs. 630/-

Dimensions : 0.80 m x O.56 m x O.35 m
No. of rows : 3
Row spacing : 20, 30, 40, 50 or 60 cm (adjustable)
Power source : one person
Width of coverage: 40 – 120 cm
Depth of operation: 70 mm
Filed capacity : 0.19 ha/h at 60 cm spacing

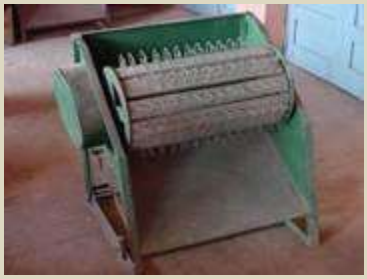
7. Manual seed drill

It is a single row-seeding device suitable for sowing different crops by changing the fluted roller of the metering mechanism. It saves 50 % on cost of operation and results in 5 % increase in yield compared to conventional method of sowing behind country plough. The cost is Rs. 2000/-

Dimensions : 1.27m x 1.0m x 0.52m
Weight : 9 kg

No. of rows : one
Metering mechanism : fluted roller
Furrow opener : shovel type
Seed hopper capacity : 2.0 kg
Power source : two person

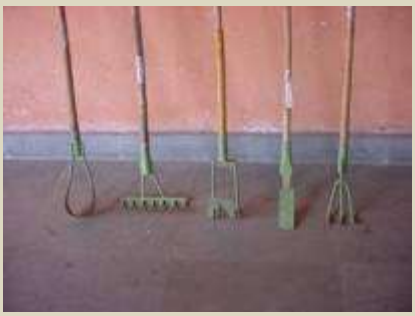
8. Pedal Paddy thresher



It is a manually operated paddy thresher consisting of threshing cylinder, pedal and grain shield. Threshing cylinder is fitted with wire loops to perform threshing operation by combing action. The cost is Rs.6000/-

Dimension : 1.25m x 0.65m x 0.63m
Output capacity : 40-50 kg/hr
Threshing efficiency : 98 %

9. Long Handle Weeders



Long handle weeders allow performing weeding operation without bending thus reducing drudgery to the operator and increase the capacity. These weeders are namely Circular (U) blade weeder, Garden rake, V-blade weeder, Grass slasher, and hand fork respectively. The uprooted weeds can be collected using garden rake. With these hand tools labour saving to the extent of 60-65% can be achieved over traditional methods.

10. 4 row pre germinated paddy seeder

It is useful for sowing pre-germinated paddy seeds in puddled fields. It is capable of sowing 4 rows at 20 cm spacing. A

lugged wheel is provided for giving drive and agitation in drums to facilitate dropping of seeds. The cost is Rs.2000/-

11. SRI row marker

Considering the demerits of rope marking, an iron roller marker was introduced. It requires two labourers to pull the iron marker which has pegs on it to mark the place of planting. The cost is Rs. 1500/-

12. Maruti foot sprayer

ASPEE MARUTI is a foot operated sprayer suitable for both small and large spraying operation on crops, in orchards and plantations. The parts are made from industrial quality brass hot stamping. The sprayer is having two discharge outlets and it develops sufficient pressure to operate with two discharge line. The equipment is supplied with 8m. long delivery hose and 2 meter long suction hose with strainer. The sprayer is less in weight and easy to move. Conforming to IS specification and with ISI mark.

13. Fruit Harvester (Crown type) with bamboo handle

It is a manual-harvesting tool with which individual fruit is first held between two jaws of the and then twisted to shear off the stock. The jaws are made of 14 gauge mild steel sheet. These are held together by a tension spring on a pivot fitted on 10 mm mild steel rod. A handle can be fitted to the tool. One of the jaws has a fever bracket and rope arrangement for operating the jaw. Three mm thick rubber sheet padding is provided on inside of the jaws to avoid any skin damage while holding the fruits. After its detachment, fruit is released by

pulling the cord in to a ring. A cloth conveyor or net is provided below the jaws for collection of harvested fruits at ground level without any damage. The tool is suitable for harvesting peach, pear and orange. Its field capacity is 250-300 fruits /man-h. The cost is Rs.145/-

14. Metallic tip dibbler

Metallic tip dibbler is used for dibbling maize and other bold seeds on hill slopes. It helps in getting better output per unit time as compared to local dibbling stick. Seeds can be sown up to 7 cm depth as compared to 3-4 cm by the wooden/nonmetallic tip dibbler. Its field capacity is about 0.10 ha/day at 40 cm row-to-row spacing and it costs Rs. 170/-

15. CIAE Animal Drawn Planter

It is suitable for planting for maize, oilseeds and pulses. It saves 64% on cost of operation compared to other conventional method of sowing behind the country plough with manual dropping of seeds. It cost Rs. 5000/- and its cost of operation is Rs. 90/-.

Dimension, (1xwxh), m : 4.2x1.3x0.9
Weight, kg : 115
No. of rows : 3
Seed metering : Inclined plate with cells.
Fertilizer metering : Fluted roller.
Furrow opener : Shoe type.
Depth of placement, mm: 100 (max)
Field Capacity : 0.12-0.15 ha/hr.
Field efficiency : 60-65%
Draft, N : 800-900
Power source : A pair of bullocks.
Labour requirement : 7-8man-h/ha

16. Rain shelter cultivation

Rain shelter-a low cost greenhouse. The frame of the rain shelter can be made of bamboo or arecanut palm poles and the roofing can be done with UV stabilized polythene sheet. The sides can be kept open to ensure ample ventilation or can be provided with insect proof netting or shade net. Permanent rain shelter with or without roof ventilation can also be utilized for growing vegetables during rainy season. Frame work can be made by GI pipes and cladding with UV stabilized film of 200 micron thickness.

CHAPTER- VIII ANNEXURE

1. Telephone directory of important agriculture and related departments / offices in KVK Ri Bhoi district

Table : Telephone directory of agriculture and related departments in Ri Bhoi district

Sl. No.	Name	Phone no.
1.	Director of ICAR RC for NEH Region, Umiam	03638-2570257
2.	District Agriculture Officer, Ri Bhoi	03638-232716
3.	Sub-Div. Agricultural Officer, Ri Bhoi	03638-232716
4.	District Horticulture Officer Ri Bhoi	03638-232715
5.	District Animal Husbandry & Veterinary Officer, Ri Bhoi	03638-232294
6.	District Fisheries Officer, Ri Bhoi	03638-232552
7.	District Handloom Officer, Ri Bhoi	03638-232124
8.	District Sericulture Officer, Ri Bhoi	03638-232824
9.	Programme C00rdinator, KVK Ri Bhoi	0364-2570011
10.	NESAC, Nongsder, Ri Bhoi	03638-2570140/03638-2570141
11.	General Manager District Industry Centre, Nongpoh	03638-232318
12.	Superintendent of Fisheries, Nongpoh	03638-232552
13.	District Forest Officer, North Division, Nongpoh	03638-232317
14.	Divisional Officer Soil Conservation, Nongpoh	03638-232257
15.	Range Officer Wildlife, Nongpoh	9436102176
16.	SDO Irrigation, Nongpoh	9615526356
17.	Joint Director Conservation Training Institute Soil Conservation, Byrnihat	03638-263451
18.	Project Manager MRDS, Nongpoh	9856035200

19.	Assistant Registrar of Cooperative Societies, O/O ARCS, Nongpoh	03638-232769
20.	State Institute of Rural Development, Nongsder	03638-570393
21.	Project Officer Meghalaya Non-Conventional And Rural Energy Development Agency (MNREDA), Nongpoh	9436102455

Table: Departmental farms

Sl. No.	**Name**	**Phone no.**
1.	Pineapple Research station cum Horticulture Farm and Nursery cum Horticulture Hub, Dewlieh, Umsning	-
2.	Ginger Development Station, Umsning	-
3.	Tea Development Center, Umsning.	-
4.	Horticulture Farm Cum Nursery, Byrnihat	-

Table: Soil Testing Laboratories

Sl. No.	**Name**	**Phone no.**
1	Soil Division, ICAR RC for NEH Region, Umiam	-

Table: Livestock farms

Sl. No.	**Name**	**Phone no.**
1.	Regional Crossbred Cattle Breeding Farm, Kyrdemkulai	-
2.	Regional Pig Breeding Farm, Kyrdemkulai	-
3.	Regional Poultry Breeding Farm, Kyrdemkulai	-

4.	Broiler Farm, Kyrdemkulai	-
5.	Feed Milling Plants, Kyrdemkulai	-

Table: Average nutrient content of common manures and fertilizers

Material	**Nutrient content (%)**		
	N	**P2O5**	**K2O**
Ammonium sulphate	20.5	-	-
Ammonium sulphate nitrate	26.0	-	-
Ammonium nitrate	33.5	-	-
Ammonium phosphate	20.0	20.0	-
Calcium ammonium nitrate	20.5 / 25.0	-	-
Nitrate of soda	16.5	-	-
Urea	46.0	-	-
Superphosphate (single)	-	18.0	-
Superphosphate (double)	-	35.0	-
Superphosphate (triple)	-	46.0	-
Mussooriephos	-	18-20	-
Rajphos	-	18-20	-
Muriate of potash	-	-	50 / 60
Bone meal	3.5	21.0	-
Fish meal	4.1	3.9	0.3-1.5
Poultry manure	1.2-1.5 1	.4 -1.8	0.8-0.9
Sheep manure	0.8-1.6	0.3-0.4	0.3-0.4
FYM	1.0	0.5	1.0
Compost	0.5	0.4	0.8
Groundnut cake	7.0	1.5	1.5
Castor cake	4.3	2.0	1.3
Neem cake	5.0	1.0	1.5
Gingelly cake	6.2	2.0	1.2

Coconut cake	3.0	1.9	1.8
Vermi-compost	1.5	0.4	1.8
Cow dung	1	0.5	1

Table: Conversion of nutrients (kg/ha) to common fertilizers (kg/ha)

Rate of application	**Ammonium sulphate (20% N)**	**Urea (46% N)**	**Superphosphate (18% P O)**	**Muriate of potash**	
				(50% K 2O)	**(60% K 2O)**
10	50	22	56	20	17
20	100	43	111	40	33
30	150	65	167	60	50
40	200	87	222	80	67
50	250	109	278	100	83
60	300	130	333	120	100
70	350	152	389	140	117
80	400	174	444	160	133
90	450	196	500	180	150
100	500	217	556	200	167
110	550	239	611	220	183
120	600	261	667	240	200
130	650	283	722	260	217
140	700	304	778	280	233
150	750	326	833	300	250

Table: Ready reckoner for making 100 litres of pesticide spray solution of desired strength

Strength of spray fluid required ai %	Number of g or ml of commercial formulation required per 100 litres of water %									
	Strength of insecticide or fungicide formulation									
	100	80	75	50	40	35	30	25	20	10
0.01	10	12.5	13.3	20	25.0	28.6	33.3	40	50	100
0.015	15	18.8	20.0	30	37.5	42.9	50.0	60	75	150
0.02	20	25.0	26.7	40	50.0	57.1	66.7	80	100	200
0.025	25	31.3	33.3	50	62.5	71.4	83.3	100	125	250
0.03	30	37.5	40.0	60	75.0	85.7	100	120	150	300
0.035	35	43.8	46.7	70	87.5	100	117	140	175	350
0.04	40	50.0	53.3	80	100	114	133	160	200	400
0.045	45	56.3	60.0	90	113	129	150	180	225	450
0.05	50	62.5	66.7	100	125	143	167	200	250	500
0.075	75	93.8	100	150	188	214	250	300	375	750
0.10	100	125	133	200	250	286	333	400	500	1000
0.20	200	250	267	400	500	571	667	800	1000	2000
0.25	250	313	333	500	625	714	833	1000	1250	2500
0.30	300	375	400	600	750	857	1000	1200	1500	3000
0.40	400	500	533	800	1000	1143	1333	1600	2000	4000
0.50	500	625	667	1000	1250	1429	1667	2000	2500	5000
1.00	1000	1250	1333	2000	2500	2857	3333	4000	5000	10000

Preparation of safer pesticides for common use

a. Insecticides

1. Kerosene emulsion

This is a contact insecticide useful against many sucking insects. For preparing this, slice 500 g of ordinary bar soap and dissolve in 4.5 litres of water by boiling. Cool and add 9 litres of kerosene under violent agitation till the oil is fully emulsified. The stock solution may be diluted with 15-20 times of water before spraying.

2. Tobacco decoction

This is very effective for controlling aphids and other soft-bodied insects infesting vegetable crops. Tobacco decoction can be prepared by steeping 500 g of tobacco waste in 4.5 litres of water for 24 hours. Dissolve 120 g of ordinary bar soap separately in another vessel. The soap solution is added to tobacco decoction under violent agitation. Dilute this stock solution 6-7 times before spraying.

3. Neem kernel suspension (NKS)

This is very effective as a repellent/deterrent against locusts, grasshoppers and other chewing insects particularly lepidopterans. The kernel should be ground into a coarse powder. The effective concentration of NKS ranges from 0.1 to 0.3%. For obtaining 0.1% concentration, 1g of powered neem seed is required per litre of water. The required quantity of the coarse powder should be put in a small muslin cloth bag and dipped in water for about 12 hours. Thereafter, squeeze the cloth bag repeatedly so that the out-flowing fluid turns light brownish. The NKS is now ready to be sprayed as such on crops.

4. Neem oil + garlic emulsion (2%)

To prepare 10 litres of 2% neem oil + garlic emulsion, 200 ml neem oil, 200 g garlic and 50 g ordinary bar soap are required. Slice the bar soap and dissolve in 500 ml lukewarm water. Grind 200 g of garlic and take the extract in 300 ml water. Pour the 500 ml soap solution in 200 ml neem oil slowly and stir vigorously to get a good emulsion. Mix the garlic extract in the neem oil + soap emulsion. Dilute this one litre stock solution by adding 9 litres of water to get 10

Litres of 2% neem oil + garlic emulsion.

b. Preparation of common fungicides

1. Bordeaux mixture (1%)

Dissolve 1 kg of powdered copper sulphate crystals in 50 litres of water. In another 50 litres of water, prepare milk of lime with 1 kg of quick lime. Pour the copper sulphate solution into the milk of lime slowly stirring the mixture all the while. Test the mixture before use for the presence of free copper, which is harmful to the plants, by dipping a polished knife in it. If the blade shows a reddish colour due to the deposits of copper, add more lime till the blade is not stained on dipping. Always use wooden, earthen or copper vessels for the preparation of Bordeaux mixture. In order to confer sticking qualities to Bordeaux mixture, rosin washing soda mixture, may be added. The addition of the sticker is particularly recommended for sprayings conducted during rainy season. For preparing the mixture, 10 litres of water out of 100 litres required for preparing Bordeaux mixture may be kept apart. Boil 10 litres of water, preferably in an earthen pot and add 500 g of good quality washing soda (sodium carbonate). Boil again until the solution becomes slightly dark in colour. Add 1 kg of powdered rosin (arpoos) in the boiling washing soda solution. Reduce the flame for avoiding frothing, foaming and spilling over. Boil the solution for 5-10 minutes till black bubbles appear. Cool the solution until the temperature reaches below 45ºC. The cooled mixture (10 litres) is then added slowly to the prepared Bordeaux mixture (90 litres) under vigorous stirring.

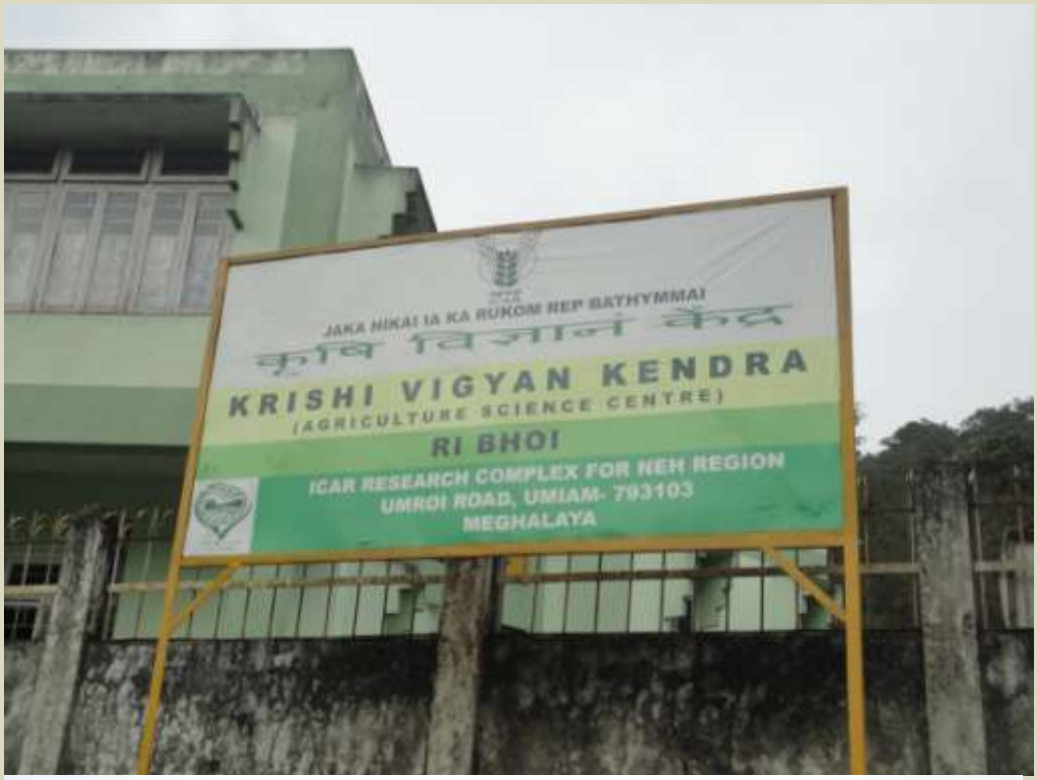
2. Bordeaux paste

Dissolve 100 g of copper sulphate and 100 g of quick lime each in 500 ml of water separately. Mix together to make one litre of the paste.

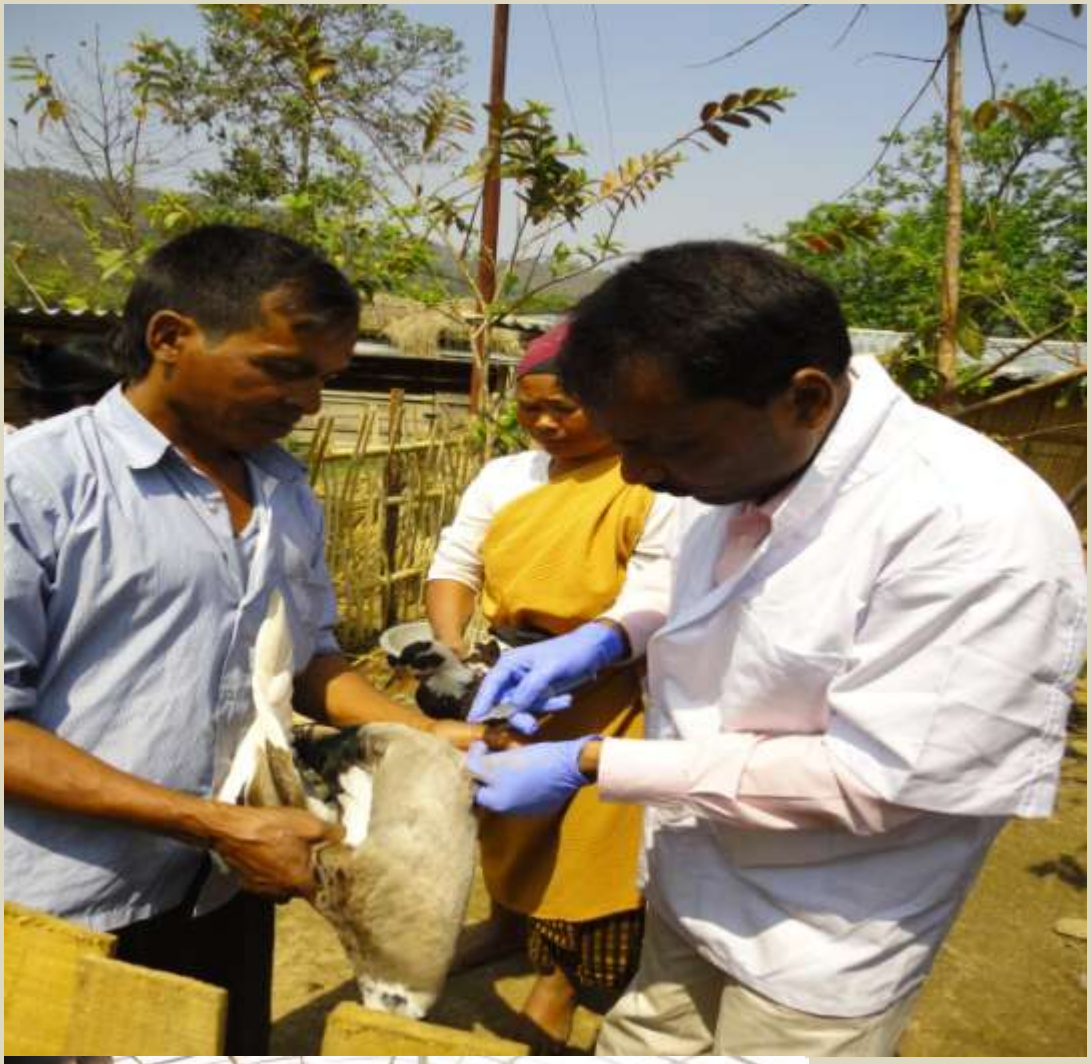
3. Chestnut compound

Weigh 60 g copper sulphate and 330 g of ammonium carbonate. These two are well powdered and thoroughly mixed. The dry mixture is stored in an airtight glass container for 24 hours before use. About 25 g of this mixture is dissolved in a little hot water and solution is made up to 8 litres with cold water and used for soil drenching.

Source: Package of Practices Recommendations: Crops, Kerala Agricultural University


JAKA HIKAI IA KA RUKOM REP BATHYMMAI
कृषि विज्ञान केंद्र
KRISHI VIGYAN KENDRA
(AGRICULTURE SCIENCE CENTRE)
RI BHOI
ICAR RESEARCH COMPLEX FOR NEH REGION
UMROI ROAD, UMIAM- 793103
MEGHALAYA


ANIMAL HEALTH CAMP

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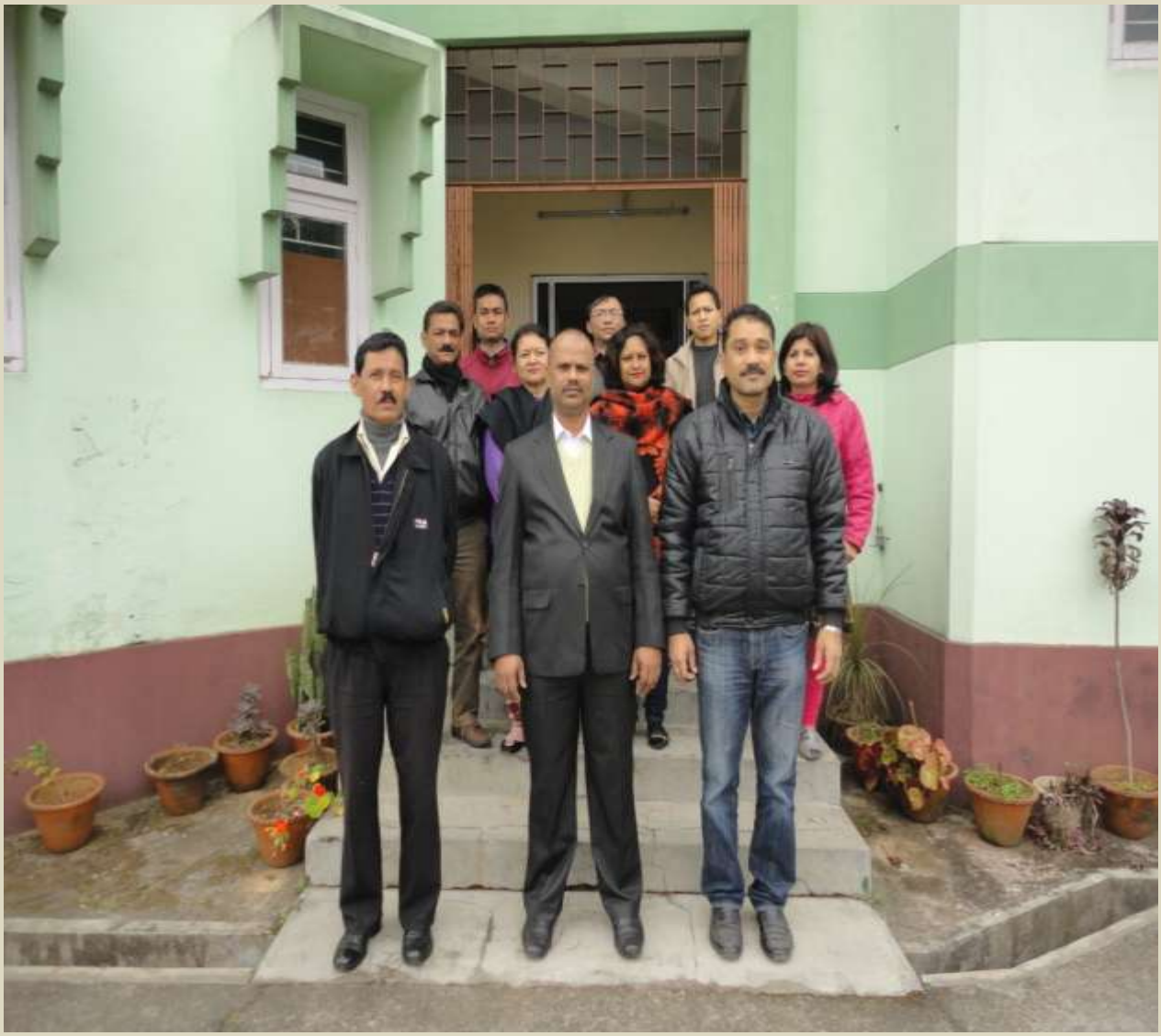
Staff information

Sr. No.	Name of Staff	Designation	Area & Discipline of Work	CORRECT & Valid Contact Number	Email address
1.	Dr. Md. Mokidul Islam	Programme Co-ordinator	Scientific (Agronomy)	9089611347 / 9856252939	mislam01d@yahoo.co.in / pckvkribhoi@gmail.com
2.	Mr. Utpal Barua	SMS	Scientific (Horticulture)	9436108633	ubarua@rediffmail.com
3.	Ms. Meghna Sarma	SMS	Scientific (Agronomy)	9436108525	meghnasarma3@gmail.com
4.	Mrs. Mousumi Gohain Das	SMS	Scientific(Plant Protection)	9436333287	mousumigdas@yahoo.co.in
5.	Mrs. Eliza C. Syiemlieh	SMS	Scientific (Home Science)	9436104341	litzcs@rediffmail.com
6.	Dr. (Mrs.) Popiha Bordoloi	SMS	Scientific (Soil Science)	9577672033	popiha@gmail.com
7.	Mr. Pynshaitbor Jana	Programme Assistant (Computer)	Technical	8732836882	pynshaitborjana@hotmail.com
8.	Mr. Albertson L. War	Farm Manager	Technical	8974242643	albertsonwar2014@gmail.com
9.	Mr. Banshaiphyrnai Khongjee	Lab Technician	Technical	9436118405	khongjeebanshai211419@yahoo.com
10.	Mr. Kishen B. Thapa	Driver	Driver	8575659412	-
11.	Mr. Badal Sukla Baidya	Skilled Supporting Staff	Supporting	9612290994	-



Group photo of staffs, kvk Ri-Bhoi

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