1. An idea for the development of agricultural sector in Assam- a group effort by the students of centre for studies in rural development (CSRD), Dibrugarh university, Assam

Surajit Saikia

The contribution of agricultural sector to India’s GDP has continued to decline over the years, while that of other sectors, particularly services, has increased. In 1970-71, agriculture contributed about 44 per cent of the GDP, which declined to 31.4 per cent and 13.9 per cent in 1990-91 and 2010-11 (at 2004-05 prices), respectively (CSO, 2012). But agriculture is still the mainstay as about half of India’s population is wholly or significantly dependent on agriculture and allied activities for their livelihood. So far as employment status is concerned about 58% of India’s populations are directly or indirectly engaged in agriculture. This situation of Indian agriculture is a kind of paradox. There are different root causes of deceleration of Indian agriculture or such paradoxical situation. Lack of value addition in Indian agricultural commodities, small size of land, failure of institutional reform, unequal benefits of green revolution among the states, under utilization of land, lack of irrigation facilities, less agricultural diversification, unorganized farmers, lack of cooperative farming, reduce soil fertility, failure of institutional credit etc. are the notable factors behind the dilemma of Indian agriculture.
Assam is predominantly rural and the economy primarily agrarian in nature with almost 70 percent of the population directly dependent on agriculture as a source of income and another 15 percent of the population dependent on allied activities for its living (State agricultural policy, Assam). The Agriculture sector in the State providing employment to more than 50 percent of the rural people. The net cultivated area of the State is 28.11 lakh hectares (2009-10) which is about 88 percent of the total land available for agricultural cultivation in the State. The contribution of Agriculture sector to the State Domestic Product was nearly 25 percent during 2010-11. So the situation of agricultural sector of Assam is not also well developed.

Underutilization of agricultural land, frequent flood, existence of small and marginal farmers, dominance of mono cropping, lack of institutional credit facilities, unorganized farmers, lack of irrigation facilities etc. are the root cause of backward agriculture in Assam. Frequent occurrence of floods in the districts like Dhemaji, Dhubri, Lakhimpur, Barpeta, in some parts of Sivasagar, Jorhat, Dibrugarh etc. makes agriculture as a non-profit enterprise. Due to lack of irrigation facilities, credit facilities, good marketing system, storage facilities etc farmers are now concentrating only one crop (Mainly winter paddy) in a year and thousands of hectares of land lying vacant during the slack season. The status of crop diversification is also very bad and negligible in the state. Now a days the young people are not interested in agriculture due to low returns and sale their labours to nonfarm sectors or the corporate sector in order to earn high wages. So labour migration or labour crisis and under utilization of land in agriculture is one of the emerging issues of agricultural development in Assam. Now very less number of people shows their interest in agriculture sector. If this situation continues to develop then in the coming years we will face higher food crisis and food inflation. Though the growth of non-farm sector is desirable for economy’s growth, but it will not maintain sustainability or inclusiveness in the growth process. We never expect that type of growth of one sector in cost of agriculture. So, new thinking, new ideas, new policies should be developed to maintain sustainability in agricultural production.

2.

Social and Economic Impacts Assessment of Mushroom Production in Uganda

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In Uganda, mushroom cultivation is regarded as an effective strategy to address shortage of arable land, provide smallholder farmers with additional income, and improve socio-economic status of women. There is a thriving market for high quality, fresh and dried mushrooms. Uganda government has made great effort to improve the mushroom industry through various programmes. However, for various reasons, the mushroom production in Uganda remains at a low level. The project, Optimizing Mushroom Spawn Production in
Uganda, funded through the AgriTT (Agricultural Technology Transfer) programme, aims to identify constraints and challenges local mushroom growers have encountered, transfer practical innovations developed by Chinese farmers to Uganda grassroots, and assess the social and economic impacts of the project. We focus on to what degree the mushroom production can improve local farmers’ livelihoods, enhance the cooperation between or within communities, and empower local women. Our goal is to combine innovations developed by both Uganda and Chinese mushroom growers, and create a model by which Uganda farmers can find a way to fund and implement these innovations appropriately.

3. Promoting Farmer Experimentation and Innovation in Sahel (PROFEIS)

Case of Mali

Assetou Kanoute, Djibril Diarra, Souleymane Diarra, Ousmane B. Diallo, Abdou Y. Maiga, Samba Traoré

This paper starts with 2 citations: the first comes from an old sage man from Mali saying “when a old Man pass away, it is a library that burns” meaning that Africa is rich in knowledge (Amadou Hampâté Ba); the second citation is from local language Bambara but translated in French, it said: l’oreille apprend de nouvelles choses tous les jours meaning that “the ears learnt new things every day”. In this case, the key elements that come out are “learning” and “new”. Africa is rich on knowledge and African farmer are creative.

After more than 4 decades of development interventions in SSA, improvement of the livelihood and incomes of poor resource farmers have been the challenges of all partners.

During the last decade, the situation has been worsening with the climate change. The causes are many, diversified, complex and interrelated. Taking all farmers in the same agroecology zones and therefore in broad sense do not work. Capital investment is necessary but not necessarily efficient for success in a harsh ecology. A very good strategy can be developed with a high investment but can fail.

This paper tries to answer two key questions: 1) how poor resource farmers in Sahel can be recognized by the public 2) how to better anchor researchers, extension agents with farmers in a collegial partnership for knowledge and mutual learning. Promoting farmer experimentation and innovation in Sahel (PROFEIS -Mali is an action research program and also a national plateform to promote the local innovation. The paper draws the rich practices, experiences and knowledge of poor resource farmers in Sahel. It also presents the Participatory Innovation Development (PID) approach, its concepts, and principles. The process to reach poor resource farmer innovations is described. This paper presents the governance of the PROFEIS –Mali and its key steps developed. The 2 main types of farmer innovations (technological and institutional innovation) are illustrated with examples in this paper. Potential themes of research from some farmer innovation are indicated. Lessons, challenges and way forward with some farmer innovations are presented.
4.

HOLISTIC LAND AND LIVESTOCK MANAGEMENT

James Chawarika
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Justification

Climate change is a sad reality of the world we live in today since the decisions we make affect the planet for generations to come. Some of these decisions include; poor livestock management, deforestation, use of aerosols and carbon emissions. These lead to rising global temperatures, shifting weather patterns and the general decline of the earth. It is in this view that the Ministry of Women Affairs, Gender and Community Development has come up with a Programme on Holistic Land and Livestock Management with the aim of eradicating poverty and hunger at household level through the promotion of the “Green Economy.” This is advantageous to the Ministry as the programme will be covering, men women and children.

The aim of the programme is to increase food production at household level Holistic Land and Livestock Management process involves the use of livestock such as goats and cattle through hooves-action to heal the land and increase crop production with limited use of chemicals and fertilizers. It encompasses the practice or system of conserving soil and water through the use of surface cover/mulch to minimize runoff, degradation and erosion in order to improve the conditions for plant growth. Crops and pastures are planted using minimum tillage techniques.

Objectives

- Manage livestock more effectively in order to increase crop yields and grazing land for livestock in order to fight poverty and hunger.
- To improve agriculture production by adopting economically, ecologically and socially sustainable methods.
- Economically empower communities at household level using available livestock.
- To achieve viable and sustainable productivity through reduced reliance on traditional cultivation.
- To heal/ restore the land.
- To conserve, improve and make more efficient use of natural resources.
- To reduce run-off and erosion through the maintenance of soil surface cover.

Outcomes

- Increase in crop yield.
- Improved natural growth productions.
- Enhanced land and financial sustainability.
- Reduced land degradation.
- Restored biodiversity.
- Improved the overall land quality.
Implementation modalities

The following are key components/pillars for a successful implementation of the framework.

- Exposure to conceptualize the Holistic Land and Livestock Management framework by the traditional leaders (Councillors, Chiefs, Headmen).
- Capacity building of the technical staff (MWAGCD, Agritex, Livestock, Veterinary Department and representatives for the identified sites in a District).

5.

An Approach for Optimization of Agricultural Parameters and Resources using Wireless Automation

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For agriculture based economy India, water requirements for irrigation keeps changing abruptly due to market demands, desired crop quality-quantity, rain uncertainties, global warming, power availability, etc. Uncontrolled irrigation severely affects production targets and crop yields due to inefficient irrigation. Apart from soil type, other critical parameters like soil moisture, fertilizer, sunlight availability, weather conditions, etc. play crucial role in deciding irrigation magnitude and frequency. Recently, wireless sensor network (WSN) has attracted attention of global researchers as an emerging technological platform to contribute novel applications and thereby explore unexplored domains. The paper puts forth a WSN based system in form of Proof-of-concept, to help achieve better crop yields by optimization of irrigation and water saving. The work included identification of critical parameters as well as development of technological framework for remote data acquisition and control. The prototype model developed presents a cost-effective, energy-efficient, adaptive and scalable system for preventing the wastage of precious water as well as for real-time compensation for rapidly changing weather conditions. Simple and user-friendly Graphical User Interface (GUI) of the system helps acquire and analyse measured parameters based on which decisions regarding the irrigation schedule have been taken in real time.

Keywords: Agriculture management, Automation, Instrumentation, Irrigation control, Technological innovation, Optimization, Wireless Sensor Network

6.

Traditional knowledge and farmer innovations in the Central and Eastern Himalayas

Ajay Rastogi, Nawraj Gurung, Reetu Sogani and Prakriti Mukerjee
Smallholder Innovation for Resilience (SIFOR)
This paper provides the context and the results of a qualitative survey on farmer innovations in the Himalayan region of India. The study carried out in five villages each in the Central and the Eastern Himalaya addressed two key research objectives: i) to identify traditional knowledge (TK)-based innovations and practices that enhance productivity, and ii) to understand the conditions and processes which foster vibrant and resilient innovation systems. There are several challenges being faced by the farmers and notable amongst those are the crop raiding by wild animals and stray cattle, changing climate and weather patterns, degradation of forests and loss of soil moisture and productivity. Farmers are developing methods to cope with these challenges and several innovations in their farming technologies, market practices and institutions were identified. Mixed cropping is now intensively practiced and has helped improve productivity by increasing moisture, reducing crop-rais by animals, planting crops to suit the changing weather patterns, and making food available throughout the year. Farmers have also modified their composting techniques to increase moisture content to counter the deficiency in rainfall; and have developed bio-pesticides which have reduced crop failure due to insects and other diseases. Innovations like increasing production of finger millets and reintroduction of locally extinct crops like *alsi* (flaxseed) have helped improve marketability due to resurgence in their demand. Government research and extension agencies have also contributed to several innovations through the adaptation of their technologies by pioneering farmers.

7.

**Prevalence of food insecurity among the small holders in rural Bangladesh, an empirical study**

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Poor people especially in underdeveloped countries are facing food insecurity and trying to cope up with this threat from their own experience and strategies. Coping strategies are embedded in the practice of the community people. So, whatever in the discussion regarding food security definition combined with nutritional status and safe food in the policy spheres and academics, there are some community perceptions and understandings, those differ from the common academic understandings. These perceptions mainly emerged from the local context. People suffering from different extent of food insecurity try to explain it with the reflection of their past experiences subject to the present context. In Bangladesh among the small holders food security is perceived as availability of enough rice grain in their granaries to meet up the yearlong demand. They don’t concern about the nutritional status or safety of the food rather they emphasize the access to food where they need not to strive. These
perceptions brought up from the past experiences they came across. Considering the
circumstances the current study tries to reveal the gap between theoretical and community
perception regarding food security and the facts which trigger the food insecurity among the
small holders of rural Bangladesh. This study triangulates both quantitative and qualitative
findings to answer the basic research questions. It is to be noted that coping strategies of a
household are much more depending on the context. The people who have occupational
diversity and strong social capital are less likely to suffer from food insecurity. The farmers
having own farming land and substantial level of income are also less likely to be food in
secured. On the other hand the household of a single occupation and affiliated with more than
one MFIs has the high probability to be food in secured. Number of loan from different
organizations and loan repayment behavior intensifies the adverse situation. This prevalence
and intensity of food insecurity mostly considered from the perception of small holders. They
have hardly any chance to think about nutritional status and safe food which encompasses the
theoretical definition of food security. To ensure food security as per the academic definition,
it requires establishing a pipeline of information from policy level to rooted people to
enhance their awareness and perception towards academic understanding.