22 Lessons for Agricultural Extension in the Coastal Zone

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Briefing Materials

The following materials illustrate concepts, interventions, outcomes and lessons learnt, including through stories from community members.

Slide decks

- Commercialisation of agriculture: improved water management conditions driving reductions in poverty (long)

Thematic brochures

- Commercialisation of agriculture: improved water management conditions driving reductions in poverty
- Outcomes of fisheries interventions to increase production, food security and incomes
- In-polder water management: maximising returns from agriculture and aquaculture
- Outcomes of livestock interventions in improving livelihoods and access to markets

Case studies

- Cropping intensity initiative: Rudhagara WMG increasing production of crops by effective water resources management
- Community-led agricultural water management at Uttar Khekuani
- Transformation from resource farmer to micro-entrepeneur
- Improving supply chain efficiency for rice farmers: Anowar's story
- Commercialising watermelon farming
- Impact of water resource management at Amadkhali, Satkhira
- Women in collective action and market linkages: increasing benfits and empowerment
- Feminisation of agriculture and the impact on women's workload

Many of the terms used for rice crops and seasons are explained in this schematic representation

The experience with the initial design of agricultural extension interventions in the first years of the Blue Gold Program and from the progressive insights leading to an evolved approach for Agricultural Development, provided valuable lessons for the future of extension in the coastal zone. These lessons focus on both the content for effectiveness and the cost-efficiency of the approach. The content is addressed in the following paragraphs, under six headings, followed by a seventh and final paragraph drawing lessons for the agricultural extension approach. The lessons for coastal agricultural extension offer a comprehensive set of practical recommendations based upon BGP's extensive field experience. It is worthwhile to note that these lessons are largely aligned to the principles expressed in the Draft National Agricultural Extension Policy from 2012[1].

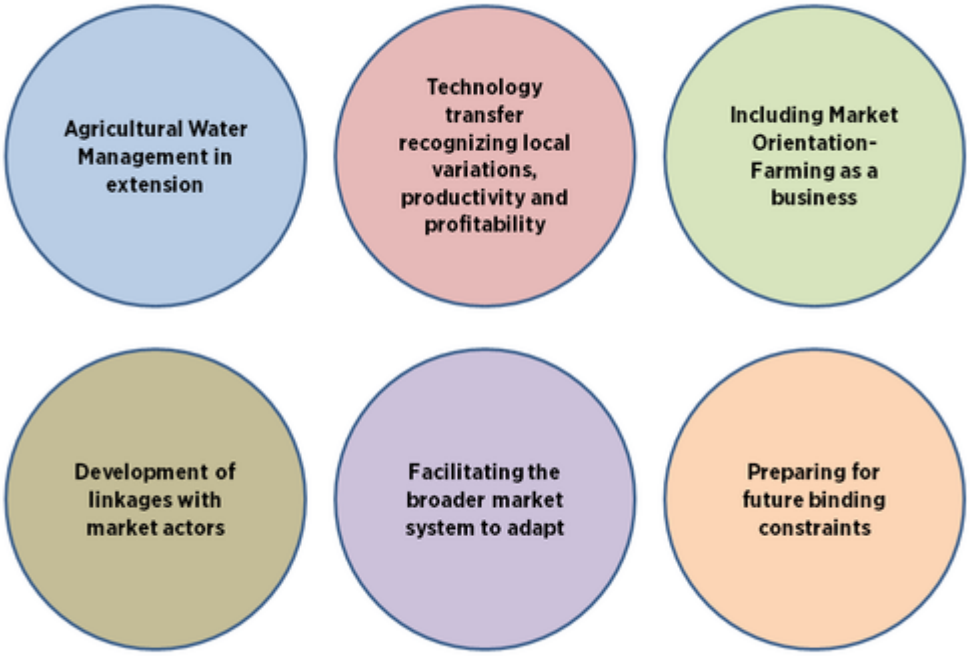

Figure 22.1 Improving extension effectiveness by content

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Contents

- 1 The role of Water Resource Management in Extension and vice-versa
- 2 Technology transfer defined by local variation and pursuing productivity and profitability
- 3 Moving beyond technology transfer – including market orientation
- 4 Developing market linkages
- 5 Facilitating the broader market system to adapt - Market system development
- 6 Future binding constraints
- 7 Efficiency of the extension approach
- 8 References
- 9 See more

The role of Water Resource Management in Extension and vice-versa[edit | edit source]

The relation between water resource management (WRM) and extension in the coastal zone is rather particular. WRM in the polders is primarily about drainage of hydrological entities which is beyond a farmer’s individual fields and thus beyond an individual farmer's control. A community of farmers producing in this hydrological unit is compelled to follow a degree of production synchronisation, definitely in the monsoon season, in view of production optimization. During the dry season these farmers may differentiate production from one another as they can irrigate individually from available fresh-water resources. This drainage defined WRM and production is in stark contrast to regions where WRM is essentially about applying irrigation. The idea is described in Box 22.1.

Box 22.1: Water Resource Management conditions and Production systems

Without program interventions, WRM conditions in terms of infrastructure and operating capability are a given, and farmers are following a production system seemingly in equilibrium with those conditions. Those conditions being poor, particularly of infrastructure, the impact of weather and climate variations is barely mitigated and risks sustain. Not surprisingly, production systems are risk averse, and primarily of a subsistence nature. From that perspective farmers pursue a rational production system. Extension can easily identify a range of technology improvements to this system. If extension promotes suitable technologies, farmers will feel encouraged to adopt these. If the promoted technologies mean an increase in risks without adequate risk mitigation by proper WRM (such as improved drainage), farmers will avoid adopting these new technologies.

The intimate relation between water control and agricultural production has programmatic implications:

- The extent to which an area can control flooding and be drained during the monsoon season will largely determine the cultivation practices of e.g. T Aman. Agriculture extension, especially DAE, must grasp local WRM conditions to define and demonstrate improved production options. Simultaneously, extension must understand crop water requirements and be able to advise farmers how to operate their water infrastructure for optimal production conditions. With very little leeway, farmers must manage water in a synchronised way during the monsoon season. Beside the need to understand WRM for optimal production, extension also plays a motivational role to undertake appropriate WRM by the Water Management Groups and/or sub-groups of WMG members as the financial benefits of improved production become clear, see figure 22.2 (below Box 22.2) with an example of a traditional versus an improved cropping system.
- During the dry season the situation is generally less complex. Extension agents need to understand the extent to which fresh-water resources will be available to define production options and to which extent farmers can maximise these water resources by operating the available infrastructure and using diverse irrigation techniques. Understanding crop water requirements will help to align production planning on a communal basis to water availability. While there is no synchronised crop production required and farmers can make an individual cropping choice, there are some limitations, which extension must help to clarify.

Insight in water management conditions and the options to manage the water resource across the year are a primary input to extension to define and advise on an improved cropping system. But extension should also weigh on the farmer's commitment to water resource management. Extension can enhance the farmers' ability to adequately operate the infrastructure by an improved understanding of crop water-related requirements. Moreover, it can assist in identifying and removing constraints to operating the infrastructure which in turn can enhance production options to the benefit of the farmers. Depending on the complexity of the constraints, this might take the form of small-scale infrastructure improvements largely under the control of the farmers, jointly implemented with Local Government Institutions as Union Parishads, or of much larger investments in in-polder water management in collaboration with e.g. LGED, BADC or BWDB (see chapter 17).

Overall, extension is just as needed in planning improved water infrastructure as it is helping farmers to reach higher levels of ambition once the improved infrastructure is delivered. In fact, the relation between WRM and extension plays at four levels: a) an understanding of the local water conditions to define production potential, be it agriculture or aquaculture; b) taking production to higher levels by infrastructure improvements; c) an enhancement of infrastructure operation in relation to crop requirements to optimise production; and d) enhancing the understanding that risk reduction and production benefits require investment in proper maintenance of the infrastructure.

Local conditions and plans will define the expected role from extension and the resulting messages. In Blue Gold, several tools served this purpose, including the participatory planning, catchment planning, unified approach, and small-scale water infrastructure investment program (see section D).

Technology transfer defined by local variation and pursuing productivity and profitability[edit | edit source]

From the previous section it should be clear that technology transfer messages must take cognisance of water resource management conditions and be defined to make the most thereof. In addition, extension messages should take a year-round cropping system perspective. Water management allows production conditions to be changed. Instead of producing in a fully weather dependent way, farmers can increasingly manage water resources across the year. Managing water in one season can impact drastically on conditions in the next season, and farmers doing this diligently can pursue a production system of higher intensification, diversification and profitability.

WRM is considered a binding constraint as a key factor influencing the optimal cropping pattern and optimal production. Altering WRM vis-à-vis altering other factors can contribute most to achieving improved productivity. But beyond water resource management, and therewith the extent of salinity, there are more factors that define an optimal production system e.g. soil type and climate. Combinedly, all these factors allow for extensive local variation in crops, varieties, timing of planting, etc. This implies that variation in the extension content will be considerable and must be developed jointly with the participating farmers and based on findings of applied on-farm research and demonstration plots.

Local understanding is a pre-requisite for agricultural extension field staff; therefore involving staff from the region has a distinct advantage. Still, the required depth of local understanding generally goes beyond that of most extension field staff and they need the support of local research practitioners and institutions. Close relations and involvement need to be facilitated. The general tendency of agronomic practitioners to focus on a single crop and on productivity improvements only, needs to be overcome. Innovations must also consider production system variations and be proven to be more profitable and/or less risky in order to be adopted by farmers, as argued in Box 22.2.

Box 22.2: The logic of a crop calendar approach

Blue Gold encouraged in suitable locations the replacement of local aman varieties with a moderately short duration HYV aman, followed by a chance crop of mustard before a winter crop, such as mung bean. To achieve this, we suggested that the timing of T Aman seedling preparation and transplanting was brought forward to the 2nd and 3rd week of July instead of mid-August. In addition, planting dates of each crop were chosen to minimise crop damage from heavy rains and cyclones, especially during early germination and prior to harvesting. See also Figures 22.2.

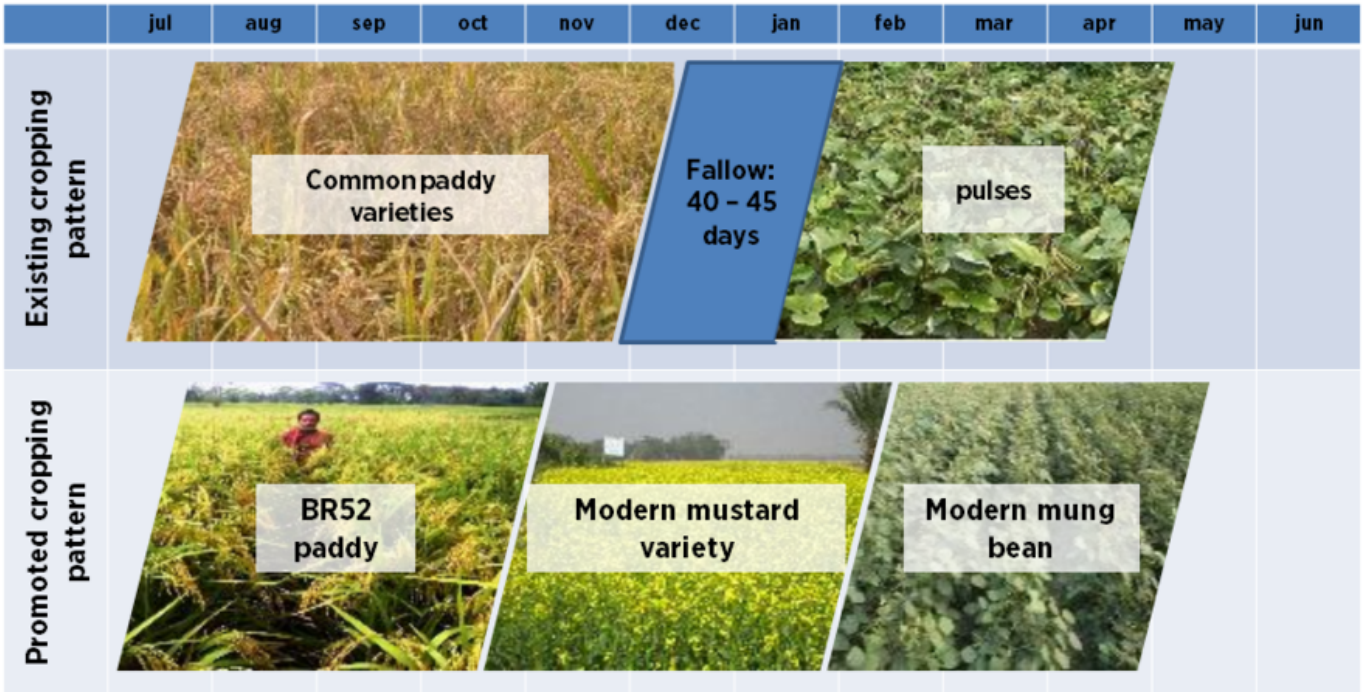

Figure 22.2 Existing and proposed crop calendar

There is a general expectation that improved WRM will be reflected in a higher cropping intensity, but this needs to be refined. Production improvements or potential can be differentiated as increases in yield, in cropping intensity and/or in diversification:

- Yield increases are generally the result from changes in cultivation technologies, including from switching the earlier crops or varieties to higher yielding varieties. Better water resource management, including irrigation, can also contribute to yield increase.
- The increase in cropping intensity can consist of a) the expansion of the area under cultivation of crops in the present cropping seasons (less fallow) and b) the expansion of the area under cultivation in an additional growing season, with the combined result of more crop harvests per unit of land.
- With diversification is meant the introduction of other crops beyond those presently grown. This is generally unlikely to occur in the T Aman season, but almost definitely in the *rabi* season and/or when crops are introduced in an additional (third) season. A production improvement through diversification would typically constitute of the replacement of an existing lower value crop with a high value crop.

Under given local conditions any of the above productivity changes can be pursued on their own or in combination. Farmers are only interested in increased land productivity if this results also in a higher profitability along with reduced risks, in particular, due to better water management. Production decisions are made from a cropping system perspective and its overall profitability.

Moving beyond technology transfer – including market orientation[edit | edit source]

Till recently, agricultural extension had primarily a technology transfer focus. By technology transfer crops and varieties are introduced along with improved cultivation practices that take most advantage from given conditions. An example is the widespread replacement, particularly in coastal Bangladesh, of local aman varieties with BR52 due to its submergence tolerance. It reflects a process of farmers adopting varieties that more closely match their present waterlogged conditions.

However, extension should also support farmers to pursue commercial agriculture, i.e. upgrading their farming operations to viable business enterprises, to reach higher levels of profitability, also as enabled by improved water management conditions. Many farmers are used to operate in subsistence mode, remaining true to the risk aversion instilled in them by failing water resource management and inherent to weather dependent decision-making. To make most of the new opportunities and the reduced risks due to improved water management, and in order to commercialise farmers, extension should go beyond technology transfer and include elements of market orientation.

What can be profitably produced and sold in the market? This requires new and a higher level of skills beyond cultivation practices. A commercial farmer considers farming as a business. He/she produces quality products to satisfy market demand in a profitable way. That requires accessing various sources of information and the careful consideration thereof to make market-based decisions related to purchasing inputs, production and marketing. Extension should make farmers aware that farming is a business and that they should operate their farm as such.

In the Blue Gold polders the information seeking behaviour of farmers was found to be limited (refer to Figure 22.3). For most decision-making moments during the production season farmers relied on their own experience or that of family and/or neighbours. This reflects a system in which little new information enters. Generating and accessing information is a first pre-requisite to enhance the ability to respond to challenges and opportunities. The decision-making skills required to farm as a business rely on basic financial literacy, record keeping, gross margin comparisons, identifying good sources of information, investment requirements and an understanding of risks. All these elements were built into BGP's extension curriculum.

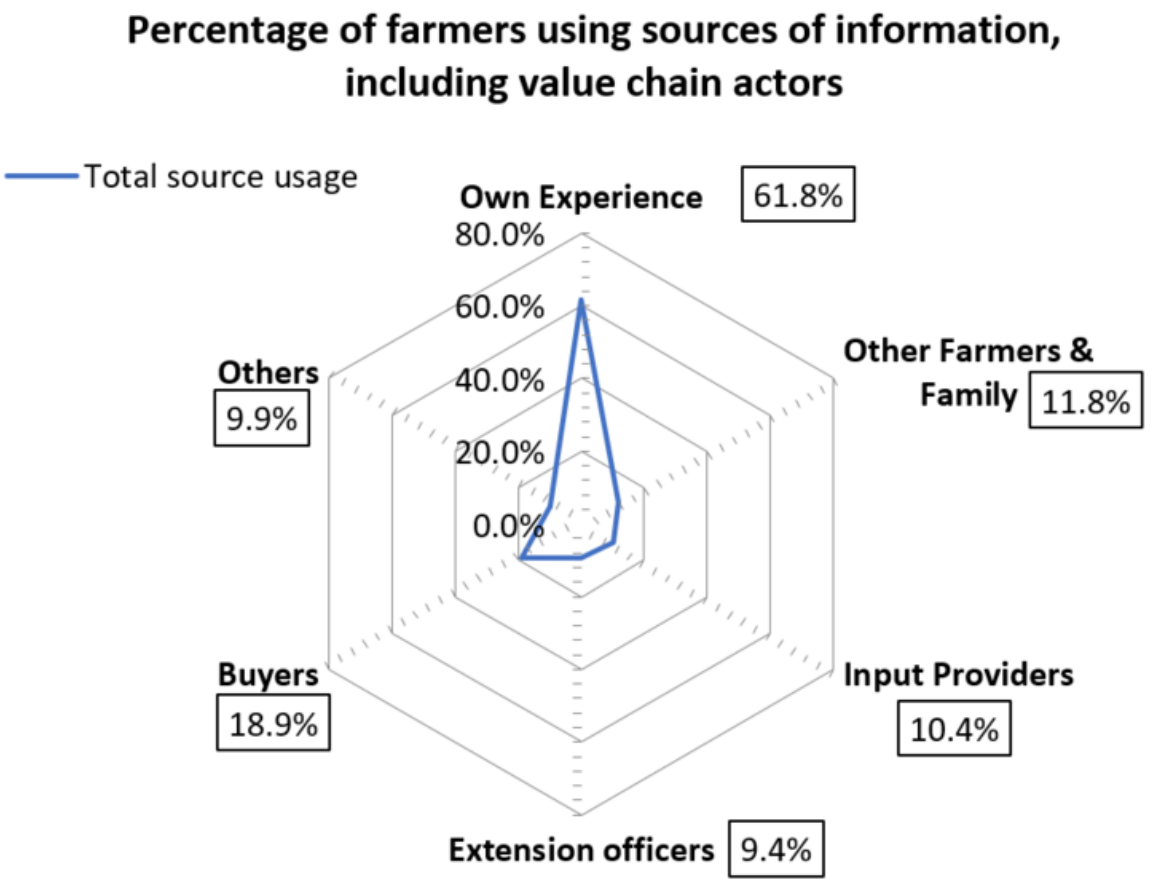

Figure 22.3 Sources of information of farmers

While new technologies and higher investment are shown to increase profitability, they also augment risks and reinforce the need to boost resilience to livelihood shocks. Due attention should be given in the extension messages to enhance farmers' understanding of the additional risks and how to mitigate these, see box 22.3 for an example. This reinforces the importance of strengthening the financial literacy of the farmers. Moreover, because additional investments and related risks have a potential impact on the entire household, the need for joint decision making by husband and wife in the farming households became even more pertinent, and therefore needs to be actively encouraged. Both husband and wife should be involved in the process of commercialising farming operations. This is also important because Blue Gold experience showed that the increase of cropping intensity and of crop yields resulted in an increased and broadened role of women within field crop production.

Box 22.3: Farmers, innovations and risks

Farmers readily recognise a profitable innovation when they see one. In some areas they saw neighbouring areas making a good profit from watermelon production and followed suit. Similarly, when the price of paddy increased by crop failures elsewhere, farmers suddenly planted boro in areas which never produced this before. The potential profit was recognised but other aspects were less well recognised and were ignored. Some households took loans to purchase expensive watermelon seed but saw their crop wiped out the first season due to heavy rainfall. For boro, farmers failed to understand their joint irrigation requirements and ran out of fresh-water resources. On the other hand, it did not take farmers long to weigh off watermelon profitability to investment in digging water reservoirs for fresh-water storage for irrigation, and so pits emerged all over the area.

Developing market linkages[edit | edit source]

Farmers are always part of one or more value chains. Even the most destitute subsistence farmers have some market linkages backward with input providers and usually also foreward with buyers. A basic representation of a value chain is given in Figure 22.4.

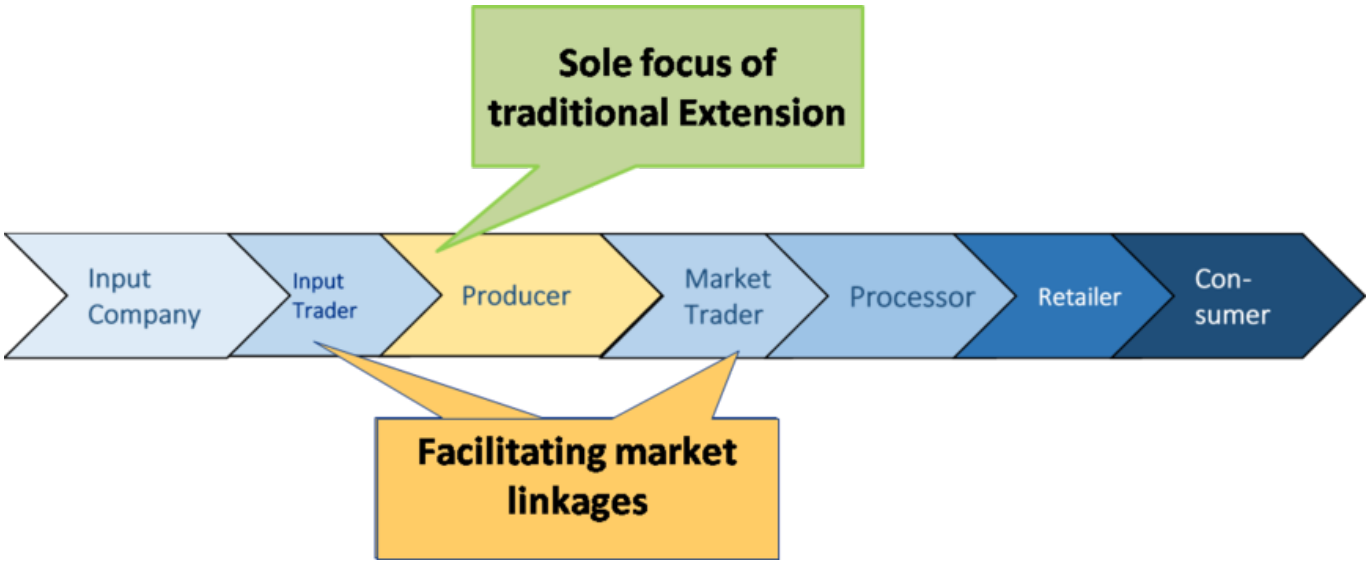

Figure 22.4 The producer and his/her linkages in the value chain

Commercialisation stimulates opening up to new practices requiring uncommon inputs, new

products, new processes and differently timed services. Commercial farming demands better and more varied market linkages with other actors in the value chain or market system, and thereby requires more skills from the producers / farmers. Agricultural extension needs to pay attention to this increased market participation in its curriculum.

Blue Gold introduced networking to enhance information seeking, and to ease access to inputs, services and markets. In practice this meant the identification of input and service providers, traders and buyers. By involving them in FFS sessions, first-contact was facilitated and relations were established to create trust and mutual understanding of challenges. Contact details, especially names and telephone numbers, of all likely persons, organisations and businesses for any activity or eventuality throughout the production and marketing process were shared and stored in mobile phones of the FFS participants.

FFS facilitators taught them to make the most of their mobiles, a tool for both financial literacy and networking. Its calculator app facilitates better insights in transaction costs. Other functions enhance access to the extension officer and the exchange of information amongst themselves. Such use of mobile phones was complemented by improving negotiation skills. Mobile phones constitute market information at farm gate and virtual access to markets, putting middlemen margins under pressure.

The BGP extension curriculum took the development of market linkages one step further. Networking stands to gain efficiency and effectiveness when undertaken by producer groups and making use of their collective bargaining power. When undertaken as collective action for a group, aggregating demand and/or supply can reduce purchase and transaction costs and increase revenues, all contributing to higher profitability. This proofed to be of particular interest to the poorer farmers. The BGP FFS facilitators worked through producer groups and built the capacity of Resource Farmers to stimulate collective action where appropriate. This was readily picked up for the purchase of inputs, such as seeds and fertilizer, and also led to several forms of coordinated selling, e.g. aggregating supply at a collection point or organising joint transport, but remained generally short of full joint marketing due to issues of trust or real or perceived quality differences. Moreover, due to local variance in connectivity, such as road systems or market locations, collective actions are not an appropriate solution everywhere. Not everything works everywhere, but the concept is not value chain bound. The underlying principles were readily picked up by the farmers and applied independently in any produce or practice they were involved in, e.g. the collective arrangement of tillage services.

Groups do not specifically have to be formed for this purpose. Due to the drainage requirements, farmers in a sub-hydrological unit already have to manage their water system together. Collective action was found to provide a stimulus to the group dynamics required for WRM. Often Water Management Group members provided necessary leadership or impetus to successful collective actions.

Facilitating the broader market system to adapt - Market system development[edit | edit source]

In the above section, the focus was on the farmer and improving his/her production potential but there are more actors and more issues in the business environment at play to support the innovations the farmers embrace. To innovate and improve, agricultural production relies on many providers of inputs, services and information. They belong to the broader market system which needs to develop in line with the farmers' innovations in order to make the changes to commercial agricultural production possible and sustainable by an improved enabling environment.

For example, when agricultural extension recommends new varieties or cultivation practices for which subsequently the seeds or mechanisation services are not readily available from input- and service providers, the farmers' adoption rates of these varieties or practices will be constrained and substantially reduced. When not attending to the market system, the demand for these innovations will only slowly filter through to potential suppliers. It is important to catalyse this alignment process and help the market system to adapt more rapidly to changes in demand. Then not only farmers, but also these businesses will grow more rapidly, contributing to polder economic growth, with agricultural production acting as a kind of flywheel. A generic presentation of a market system is presented in Figure 22.5.

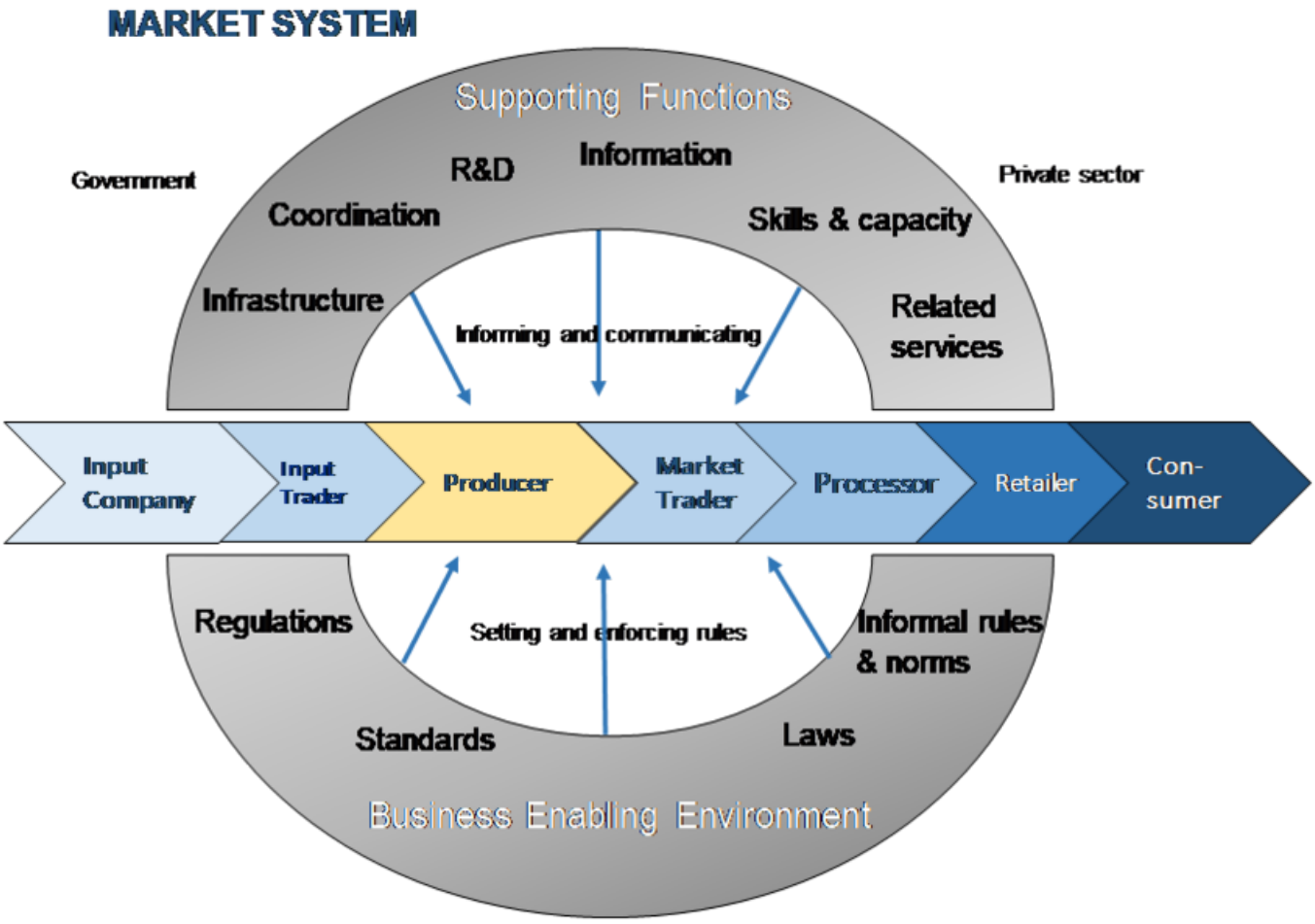

Figure 22.5 Value chain and the market system

In Blue Gold, the evolving mixed approach of improving agricultural production and market system development, though confining itself geographically largely to the polders, provided insights in the broader market systems. A limited but practical set of interventions strived to catalyse market system development. While implemented alongside the core FFS approach, their nature is such that they can form part of a broader extension content. The following insights were gained:

- **Promoting collective actions:** In thin markets, inputs and services essential to production innovations, are generally scarce, costly to access and/or to obtain. Collective actions by producer groups are one way to partially overcome related constraints. In practice, this requires lead farmers or Resource Farmers to facilitate the contact between the producer groups and other actors in the market system. Blue Gold identified and built the capacity of Resource Farmers. For Resource Farmers (RFs) to negotiate for inputs and services e.g. tillage for a group of farmers, they arrange coordinated sales upon agreement with buyers, and act as a more efficient conduct for extension messages. One, or even better a few,

Resource Farmers were selected from each producer group and were given advanced capacity building for collective actions. This included additional financial literacy, market visits and negotiation skills. Compensation of the efforts of the RFs by the members of the producer group was an option, and the fairness of remuneration models were discussed and assessed with the broader group. The role of selected Resource Farmers was expanded to act as local resources or representation to WMOs and other actors in the polder or region.

- **Linking farmers to other value change actors:** Input- and service providers, buyers and extension agents, public as well as private, and even local authorities were brought together with (resource) farmers across the year during several FFS cycles. While some were already involved in FFS sessions to facilitate linkages, the additional get-togethers took the form of workshops to consider specific common issues, local challenges and opportunities. While always strengthening relations, sometimes win-win solutions in the form of collective actions could be worked out on the spot. At other times it improved understanding of each other's problems and intentions and served to catalyse the market system adaptation process. This often took very simple forms: an input provider who got to know that certain varieties were recommended could better prepare him/herself for a newly arising demand; similarly for a tillage operator becoming aware of changing cropping systems and farmers' land preparation intentions. A more complex example addressed the detested hand-weighing in a sesame market. Through the arrangement of a (temporary) collection centre with a leading buyer agreeing to use digital scales and corresponding market prices, other buyers felt forced to follow and the hand-weighing practice was done away with, leading to fairer payments and increased trust.
- **Improving capacities of input providers:** Blue Gold organised business training to input providers and various service providers, e.g. power tillage operators. The capacity building with the input providers was organised in cooperation with the Agro-Input Retailers Network (AIRN), a network set up by a USAID project. It offered the opportunity to explore the agricultural production trends resulting from the improvement of water resource management, to introduce the concept of collective actions and not to consider it as a threat but to show the mutual benefits thereof, and to direct input providers to on-line sources of information to enhance farmer trust in their advice and services. Upon completion, trainees got certification by AIRN. With respect to the win-win of collective actions: some input providers did not immediately see the collective purchase of inputs as a win-win, as they only saw the discount they would have to give. Others quickly understood the advantage to them of bulk orders and selling volume, where the profit of the enlarged sales volume and the reduced handling costs well outweighed the discount in unit price. Some input providers even started to promote collective action themselves, an example of sustainable change introduced in the market system.
- **Promoting coordinated selling:** There was a natural bias by BGP experts on the input side of the value chain while many had rather expected a BGP focus on 'marketing and physical market infrastructure'. However, the improved water conditions generally enabled production increase of those commodities for which marketing channels were already rather mature. For these products there was sufficiently tough competition to keep trader margins low, which was further enhanced by an increase in producers' awareness on fair prices through mobile communication. This may be contrary to expectations, but it was confirmed by Value Chain Analyses. Nevertheless, there appeared win-wins in facilitating properly discussed and negotiated 'coordinated selling' by farmers to buyers, at collection points where necessary, or through organised transport and delivery. Again, much was facilitated through mobile communication and advance negotiating, reducing the need for utilisation of physical market infrastructures. While bulking or aggregating is always of interest to traders, issues of quality remuneration and weighing practices often proved more challenging and needed to be clarified and agreed upon. Particularly farmers were found to be reluctant to pool their

produce. There is a lack of trust among them to leave it to a leader to negotiate on their behalf, as well as a strong perception that his or her own produce is anyway of better quality than that of others.

- **Expanding access to information:** Farmers are also in need of information beyond what the extension officers can provide but which could be found in the business enabling environment, such as information on fertilizer dose, pest control etc. While many sources of information do exist, most are still unknown to farmers, and/or were found to be too difficult to access for most farmers for technical reasons, by language, and/or by presentation because farmers have limited educational background. Still ICT systems are rapidly developing, also in the rural areas, and instead of farmers others can act as intermediaries in accessing such sources of information at the internet. Blue Gold approached and supported local intermediaries e.g. Resource Farmers and input providers, to play this role. Simultaneously it called upon the information providers, including DAE and research institutions, to make their information sources more accessible to farmers.

Future binding constraints[edit | edit source]

Blue Gold addressed Water Resource Management as a binding constraint, which means a key restriction to increase agricultural production was (partially) removed. Removing this constraint opens up more production potential ahead of meeting other constraints e.g. agricultural finance. That means that once the WRM constraint is resolved, other constraints to further increasing production come to the fore and become the next binding constraint. Extension should identify and consider these future binding constraints at an early stage and relate them to researchers and/or policy makers. The Blue Gold experience provides some insights.

The increased productivity of the land brings along an increased demand for labour, labour that also increasingly seeks opportunities outside agriculture and the polder. Labour shortages become more often common at peak periods and/or labour costs make some cultivation practice adoption too costly to implement e.g. line sowing in mung bean. Mechanisation appears the next binding constraint but should not be indiscriminately pursued. There is still underemployment during low-demand periods. Mechanisation should seek to resolve peak demand bottlenecks related to specific practices in the first place.

The higher demand for labour due to increasing productivity and cropping intensity has additional consequences. The increased labour demand seeks in the first place a higher labour input from the farming household, i.e. unpaid family labour by male and female household members. If the contribution of women to increased production and income is recognised and explicitly valued, it makes them proud and can empower them by increasing their status and their participation in decision-making. But for many women the increased involvement in field crops also means a risk of becoming overburdened due to the many domestic tasks they have, which are hardly shared with men. Due to the increased productivity, women are increasingly taking up agricultural tasks which were previously the domain of men, including upholding market linkages; this is also enhanced by male migration. Extension approaches should adapt to these changing situations, often referred to as the 'Feminisation of Agriculture', see also Section F, Chapter 24 “Gender Equality and Women’s Empowerment”.

Efficiency of the extension approach[edit | edit source]

While there is an obvious requirement to extend the content of agricultural extension messages, extension resources are scarce and costly. In BGP consideration was given to increasing the efficiency of the extension approach in a variety of ways. These are listed in Figure 22.6 and

discussed below.

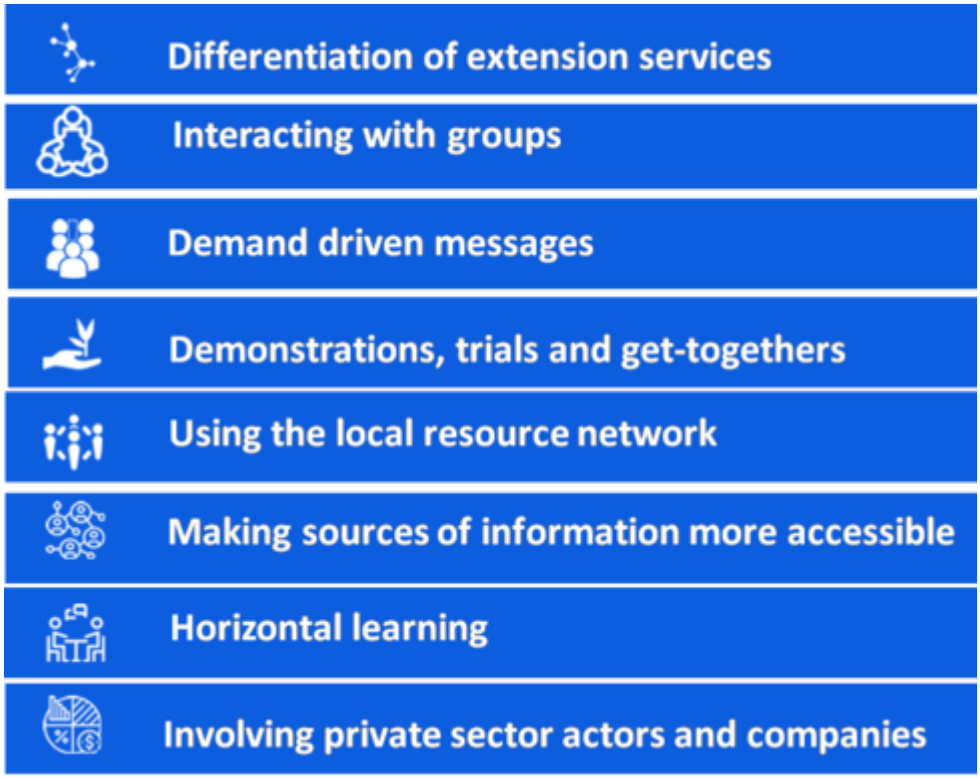

Figure 22.6 Improving the efficiency of extension approaches

- **Targeting extension more accurately by a differentiated approach**: The households in the polders are heterogeneous in terms of their labour and access to assets, not least to land. As a result, they have varying livelihood strategies and are best served by differentiated support strategies. An appropriate background to this is the rural transformation framework. This was discussed in chapter 21 in more detail (in the final section on "Differentiating households"). The key point here is about properly targeting the participating households with different needs for agriculture extension. Extension gains efficiency if its messages are directed at those households which can benefit from it, while others receive different support adapted to their household characteristics. Moreover, within a household, specific extension messages should especially reach out to the person(s) who can and will apply the new information. For example, this means that targeting should not be based on traditional gender roles, rather on who in a household is interested and able to take up certain agricultural responsibilities.
- **Interacting with producer groups:** With respect to the households interested in stepping up their agricultural activities in the coastal zone, group formation on a sub-catchment basis is an underlying requirement in order to synchronize production to better benefit from improved water resource management. Also, the advantage in terms of networking and collective action was already referred to, along with the role Resource Farmers can play as contact and conduct for a variety of other market actors. Extension field officers increase their outreach by linking up with producer groups through Resource Farmers and/or Water Management Groups of which the farmers are the core members. Mobile communication adds another dimension to this outreach. It allows the sharing of information and best practices from distance in a broad array of forms, audio as well as visual.
- **Becoming more demand driven**: To enable commercialisation, the classic, single crop, technology transfer focused DAE FFS curriculum was revised by adapting it to take a cropping system perspective, grounding extension messages in local water management conditions, and making provision for market orientation. Nevertheless, most importantly from an efficiency perspective, the technology transfer also needed to be reviewed. The session content was

revisited to delete what farmers already know or have sufficient experience with. This went hand in hand with better targeting whereas further efficiency was gained by including only actual farmer needs and focussing on critical technologies. By being demand driven, the number and length of sessions across the cropping system could be held in check. This was also based on experiences from some other projects that successfully undertake Farmer Field Schools with a limited number of sessions carefully directed at actual gaps in farmer knowledge. There is also a second dimension to this. Considering the varying and complex environment of the coastal zone, it is important to identify the appropriate answers to local conditions and integrate these in extension messages to make them location specific. This requires close cooperation and collaboration between DAE and BWDB, LGED, BADC and local government institutions, but also between field extension officers and field researchers or practitioners of regional knowledge institutes, DLS and DoF.

- **Seeking less resource intensive methodologies**: The core of the extension approach is experiential learning. It should be hands-on and discovery-based through demonstrating cropping systems which are more productive and profitable. Within Blue Gold, most extension still took the form of classic Farmer Field Schools (DAE FFS, CAWM, MFS) but increasingly less resource intensive methodologies were pursued, for example, organising the main messages around a sufficiently large demonstration, organised by DAE or by others, including the private sector. An approach to credibly motivate farmers to undertake water resource management and serve as a successful example of an alternative, less resource intensive, extension methodology, were the Cropping Intensity Initiatives (CIIs), see box 22.4. In selected locations large year-long demonstrations were set up with farmers. Around these eye-catching innovations, farmers and other market actors were gathered in a variety of demand driven sessions and workshops.

Box 22.4 Cropping Intensity Initiative

The Cropping Intensity Initiative (CII) is an initiative by the Blue Gold Program to demonstrate the advantages of year-round crop planning to maximise the number of crops grown on one plot, developed jointly by the agricultural extension agency (DAE) and Blue Gold TA staff. CII involves the planting of a short-duration high yielding T Aman variety earlier than normal, thus allowing one and possibly two more profitable crops, eg mustard and vegetables, to be planted during the rabi season, generally increasing the cropping intensity from 200% to 300%. CII motivated farmers to improve their drainage system at field level, also increasing opportunities for irrigation in the dry season. Apart from the increased cropping intensity, yields per unit land also increased, such as paddy yields, due to the use of more appropriate and better yielding varieties. CII also led to increased work opportunities for landless people who depend on wage labour for their livelihoods, for example, because the short duration paddy requires wage labour in November, a period during which hardly any other work opportunities are available.

In areas where the water infrastructure rehabilitations provided under Blue Gold had not yet been implemented, the CII demonstrations were carefully chosen on medium to high land without drainage constraints and close to a source of irrigation water. This allowed farmers in lower-lying areas to witness practical examples of agricultural practices which they could implement when improved water management became possible once water infrastructure was improved.

- **Using local resources**: Extension does not solely have to rely on external resources. Technology transfer and market orientation get additional impetus and gain efficiency from the involvement of properly trained Resource Farmers and Farmer Trainers, as well as from the practical experience of nearby local entrepreneurs, such as certified input suppliers, and

farmer role models or lead farmers. They are often prepared to share their knowledge or experience in sessions, serve as demonstration sites, function as resource persons, and/or provide opportunities to access information or markets in various ways.

- **Making sources of information accessible**: Farmers are in need of various types of information. Not all these needs should be met by depending on the accessibility of the (government) extension officer. Many other sources of information exist but farmers find them difficult to access for various reasons. An appeal is made to the providers of such information, in the first place DAE, but also other programs, research institutions and even private companies, to make their information sources more accessible to farmers. Support to farmers to master the ICT technology which they readily have in hand -even many women farmers have own mobile phones nowadays-, would strengthen efficiency gains even more.
- **Making better use of Horizontal Learning**: Blue Gold demonstrated that Horizontal Learning, where farmers learn from each other, can be a very efficient way to spread knowledge and experience to a wider target audience. It has been a general feature of FFS in the form of Farmer Field Days, but there were many more opportunities and forms to achieve horizontal learning e.g. through exchange visits, introduction sessions to demonstrations, information via mobiles, etc. For more details of Horizontal Learning in Blue Gold, see Chapter 33.
- **Involving the private sector**: The direct involvement in the networking by input providers and buyers, including supply companies, opened new avenues for the private sector to act as extension agents and organisers of demonstrations or providers of market information. Public and private sector extension agents willingly cooperated e.g. in demonstrations and horizontal learning. BGP trained local input traders in ethical business and put emphasis on the need for long term business relationship with customers, thus ensuring supply of quality products with a focus on business integrity to safeguard farmers' interests.

References[edit | edit source]

1. ↑ *National Agricultural Extension Policy* (PDF). Government of the People’s Republic of Bangladesh, Ministry of Agriculture (MOA). 2012.

See more[edit | edit source]

Previous chapter:
Chapter 21: The Evolving Approach to the Commercialization of Agriculture

Blue Gold Lessons Learnt Wiki
Section E: Agricultural Development

Next chapter:
Chapter 23: Outreach and Outcomes of Commercialisation Interventions

Section E: Agricultural Development

Chapter 21: The Evolving Approach to the Commercialization of Agriculture	Chapter 22: Lessons for Agricultural Extension in the Coastal Zone	Chapter 23: Outreach and Outcomes of Commercialisation Interventions
1. Project documents: Expectations and approach at the start 2. Lines of change during implementation – an evolving approach	1. The role of Water Resource Management in Extension and vice-versa 2. Technology transfers defined by local variation and pursuing productivity and profitability 3. Moving beyond technology transfers – including market orientation 4. Developing market linkages 5. Facilitating the broader market system to adapt - Market system development 6. Future binding constraints 7. Efficiency of the extension approach	1. Impacts of the commercialisation interventions 2. Household outreach of commercialisation interventions 3. Cost of commercialisation interventions 4. Outcomes of Commercialisation interventions

Executive summary: A Call for Action		
Section A: Background and context	**Section B: Development Outcomes**	**Section C: Water Infrastructure**
Summary • Chapter 01: Overview, Purpose and Structure of Report • Chapter 02: Institutional Setting • Chapter 03: Social, Physical and Environmental Context • Chapter 04: Policy framework, history of interventions and project definition	**Summary and Introduction** • Chapter 05: Outcomes and Impact from Participatory Water Management • Chapter 06: Outcomes and Impact from Agricultural Development • Chapter 07: Inclusive Development Approach: Outcomes and Impacts from Homestead Based Production • Chapter 08: The Outcomes and Impact on the Livelihoods of Women • Chapter 09: The Overall Outcomes and Impacts on the Livelihoods of Coastal Communities in Blue Gold Polders	**Summary** • Chapter 10: Coastal Infrastructure • Chapter 11: Investments for Polder Safety and Water Management • Chapter 12: Survey, Design and Procurement • Chapter 13: Construction: Progress, Modalities and Lessons Learnt
Section D: BGP Interventions: Participatory Water Management	**Section E: Agricultural Development**	**Section F: Responsible Development: Inclusion and Sustainability**
Summary • Chapter 14: Consultation and participation in planning • Chapter 15: WMO capacity building • Chapter 16: Women's participation in Water Management • Chapter 17: In-polder water management • Chapter 18: Water Management Partnership • Chapter 19: Operationalisation of the PWM concept • Chapter 20: Way Forward	**Summary** • Chapter 21: The Evolving Approach to the Commercialization of Agriculture • Chapter 22: Lessons for Agricultural Extension in the Coastal Zone • Chapter 23: Outreach and Outcomes of Commercialisation Interventions	**Summary** • Chapter 24: Gender equality and women's empowerment • Chapter 25: Poverty Focus: development of homestead production • Chapter 26: Poverty focus: Labour Contracting Societies • Chapter 27: Sustainability
Section G: Project Management	**Section H: Innovation Fund**	**Files and others**
Summary • Chapter 28: Project Management Arrangements • Chapter 29: Technical Assistance: Context, Scope, Contractual Arrangements and External Service Contracts • Chapter 30: Evolution of TA Organisational Arrangements • Chapter 31: Capacity Building • Chapter 32: Agricultural Extension Methods and Communication • Chapter 33: Horizontal Learning • Chapter 34: Monitoring and evaluation • Chapter 35: Management Information System • Chapter 36: Environmental Due Diligence	**Summary** • Chapter 37: Purpose, fund evolution and management • Chapter 38: Overview of BGIF Projects • Chapter 39: BGIF Lessons Learnt	• **File Library** • **Glossary and acronyms** • **Frequently Asked Questions**

A defined set of temporary activities through which facilitators seek to effect change

Blue Gold Program

Water Resource Management

transplanted aman; a rice crop, with nurseries for seedlings started in June/July, for transplanting in July/August in areas liable to a maximum flood depth of about 50cm. Harvested in November/December. Local varieties are sensitive to daylength whereas modern varieties are insensitive or only slightly sensitive.

Department of Agricultural Extension, a department of the Ministry of Agriculture responsible for disseminating scientific research and new knowledge on agricultural practices through communication and learning activities for farmers in agriculture, agricultural marketing, nutrition and business studies.

Water Management Group - The basic organizational unit in Blue Gold representing local stakeholders from a hydrological or social unit (para/village). Through Blue Gold, 511 WMGs have been formed and registered. The average WMG covers an area of around 230 ha has 365 households or a population of just over 1,500.

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In-polder water management; term used in Blue Gold to describe water management interventions which aim to deliver excess water from the field through field drains to secondary khals and thence to primary khals for evacuation through the sluice/regulator

Local Government Engineering Department

Bangladesh Agricultural Development Corporation

Bangladesh Water Development Board, government agency which is responsible for surface water and groundwater management in Bangladesh, and lead implementing agency for the Blue Gold Program

the adjustment of gates in water management infrastructure to control hydraulic conditions (water levels and discharges) in a water management system.

actions taken to prevent or repair the deterioration of water management infrastructure and to keep the physical components of a water management system in such a state that they can serve their

intended function.

Identification and planning of both interventions and operations & maintenance within the catchment, resulting in an action plan for the catchment.

The Blue Gold approach which integrated the earlier 'four components' (ie social empowerment, water management infrastructure, agricultural technologies and farming-as-a-business) into a single work process

a rice crop usually planted in March/April under dryland conditions, but in areas liable to deep flooding. Also known as deepwater rice. Harvested from October to December. All varieties are highly sensitive to daylength.

High Yielding Variety - Introduced varieties developed through formal breeding programs. HYVs have a higher yield potential than local varieties but require correspondingly high inputs of fertiliser and irrigation to achieve high yields.

Cropping intensity - The number of crop harvest per unit land per year. The average cropping intensity (CI) is calculated as the total area of all crops per year divided by the area of cultivable land. In its CI calculations BGP treats fish ghers as another crop; the DAE method excludes fish ghers in its CI calculations. Hence the CI calculated by BGP is higher than as calculated by DAE.

The dry season (typically mid-October to mid-March) with low or minimal rainfall, high evapotranspiration rates, low temperatures and clear skies with bright sunshine. Crops grown are boro, pulses, sunflower, sesame and mungbean.

human intervention in the capture, conveyance, utilisation and drainage of surface and/or ground water in a certain area: a process of social interaction between stakeholders around the issue of water control.

Within BGP this refers to enhancing insights of especially FFS participants in how markets work, how to collect market information, facilitating linkages with market actors and increasing negotiation capacities

agricultural production aimed at meeting market-demands. It is based on establishing a profitable farming unit and involves a multitude of business relations with other actors in the market system. Used in contrast to subsistence farming which focuses mostly on home consumption.

Any formal or informal structure (not necessarily a physical place) in which buyers and sellers exchange goods, labour, or services for cash or other goods. The word 'market' can simply mean the place in which goods or services are exchanged. Essentially, markets are defined by forces of supply and demand, rather than geographical location

A rice crop planted under irrigation during the dry season from December to March and harvested between April and June. Local boro varieties are more tolerant of cool temperatures and are usually planted in areas which are subject to early flooding. Improved varieties, less tolerant of cool conditions, are usually transplanted from February onwards. All varieties are insensitive to daylength.

Also known as 'business linkages'. Linkages refer to the trading relationships between and among producers, input providers and traders, and other enterprises in a supply chain or value chain. We refer to Backward linkages on the input side and Forward linkages on the output side of the producer.

Value chain - the set of activities that need to be performed in a specific production sector in order to deliver the end product to the consumer. Agricultural value chains typically include input supply, growing/production, processing and marketing/distribution.

A process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them.

Farmer Field School - A group-based learning process through which farmers carry out experiential learning activities that help them to understand the ecology of their fields, based on simple experiments, regular field observations and group analysis. The knowledge gained from these activities enables participants to make their own locally specific decisions about crop management practices. This approach represents a radical departure from earlier agricultural extension programmes, in which farmers were expected to adopt generalized recommendations that are formulated by specialists from outside the community.

Generally refers to how many and/or in which way people are able to buy or sell, and reach, a reliable supplier or buyer in a market

Collective action - by a producer group is one way to partially overcome constraints such as in weak markets, where inputs and services essential to production innovations, are generally scarce, costly to access and/or to obtain. Collective action is working in group instead of individually in order to gain economic or social benefit. Through collective action, farmers can address constraints in their market linkages, organise their activities jointly and use their collective bargaining power to reduce input costs through bulk purchase, or to obtain services from buyers such as farm-level collection of produce

Resource Farmers (RF) are members of Farmer Field Schools (FFSs). They are selected from the FFS groups to lead other members in organizing different useful collective actions and to maintain networks on behalf of the members. These RFs are given additional capacity building training to enhance their knowlege on simple record keeping and business skills.

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an environment of policies, regulations, norms, institutions, and overall economic governance which allows market systems to function and perform well

An area of low-lying land surrounded by an earthen embankment to prevent flooding by river or seawater, with associated structures which are provided to either drain excess rainwater within the polder or to admit freshwater to be stored in a khal for subsequent use for irrigation.

Increase in the capacity of a country or an economic region to produce goods and services. It also refers to the increase in market value of the goods and services produced by an economy. It is usually calculated using inflation adjusted figures, in order to discount the effect of inflation on the price of the goods and services produced

Water Management Organizations - The common name of organizations of the local stakeholders of a water resource project/sub-project/scheme. The concept WMO typically refers to WMGs and WMAs (and/or WMFs) together

Value chain - the set of activities that need to be performed in a specific production sector in order to deliver the end product to the consumer. Agricultural value chains typically include input supply, growing/production, processing and marketing/distribution.

Information Communication Technology

The strategies that people employ in order to utilize and transfer assets to produce income today and deal with problems tomorrow. These strategies change and adapt in response to various shocks, external influences, institutional norms and rules, and other factors.

A process of change in rural areas strengthening the local economies

Part of the catchment which is not directly connected to the regulator, and is hydrologically independent from other parts of the catchment.

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Department of Livestock Services, a government department under the Ministry of Fisheries and Livestock responsible for the livestock industry in Bangladesh

Department of Fisheries, a government department under the Ministry of Fisheries and Livestock responsible for regulating the fisheries industry in Bangladesh

Community-led Agricultural Water Management - with DAE, Blue Gold established a network of schemes for demonstration purposes where locally-applicable annual cropping patterns are introduced along with water level control facilitated by small-scale water infrastructure, and the development of value chain skills in farmers

Market-oriented Farmer Field School - Farmer Field Schools dealing with cash crops or other commercial production, such as aquaculture, integrating market orientation. Specific MFS were conducted in the first years of BGP; later all FFS included market orientation.

Cropping Intensity Initiative: Year-long demonstrations with farmers on increasing cropping intensity related to improved water management, also involving market actors, and by organising demand driven sessions and workshops

contiguous area of land operated as a single unit by a farmer - average area of 27 decimals (0.11 ha), with a normal range between 10 and 70 decimals (0.04 to 0.28 ha)

Technical Assistance

assumed in this report to operate up to 0.5 acres (0.2 ha)

A livelihood is a way of making a living. It comprises capabilities, skills, assets (including material and social resources), and activities that households put together to produce food, meet basic needs, earn income, or establish a means of living in any other way.

Farmer Trainer - Well-performing and capable farmers, previously trained in Farmer Field Schools, who became FFS facilitator themselves after ToT training

Learning from peers; and in the context of Blue Gold, farmer-to-farmer learning in which a host WMG invites representatives from visiting WMGs to witness an event - such as the harvesting of a new variety of rice - to pass on the knowledge and lessons gained from their experience

Farmer Field Day - Exchange events organized at the end of each Farmer Field School to share the FFS learnings with other community members

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- Page
- Discussion

Variants

This page was last edited on 21 November 2021, at 11:50.

Blue Gold Program Wiki

The wiki version of the Lessons Learnt Report of the Blue Gold program, documents the experiences of a technical assistance (TA) team working in a development project implemented by the Bangladesh Water Development Board (BWDB) and the Department of Agricultural Extension (DAE) over an eight+ year period from March 2013 to December 2021. The wiki lessons learnt report (LLR) is intended to complement the BWDB and DAE project completion reports (PCRs), with the aim of recording lessons learnt for use in the design and implementation of future interventions in the coastal zone.

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