PUTTING VALUE CHAIN-ORIENTED RNRRS OUTPUTS INTO USE IN ASIA: CURRENT STAGE OF LESSON LEARNING

1. Introduction

Ten years (1995-2006) of research funded under DFID's Renewable Natural Resources Research Strategy (RNRRS) generated new knowledge that was expected to address the needs of poor communities in Asia and Sub-Saharan Africa (SSA). The DFID-funded Research into Use (RIU) Programme follows earlier investments made in RNRRS research. In practice it is about putting into use the knowledge generated by RNRRS into wider use to reach larger sections of communities and have positive impacts on their livelihoods. To be effective, this can only be done through a context-embedded process involving relevant stakeholders. In line with this thinking, different agencies implementing RIU components are trying different approaches in Asia and Africa. All these approaches have the potential to generate lessons, which could be used for planning future research for development interventions. The Central Research Team (CRT) commissioned by RIU is trying to synthesise these lessons, with a focus on the processes involved in putting knowledge into use.

Among these diverse initiatives, a group of RIU projects in Asia is putting into use value-chain oriented knowledge generated from RNRRS initiatives. For the convenience of synthesising lessons, the CRT has classified these under the Opportunity-Led Innovations narrative. For this category, it is hypothesised that: "opportunities presented by large markets of poor people are leading the emergence of new types of innovation processes and products. Also emerging are innovation processes that are invisible to research and corporate communities due to alternative professional views of excellence and success. These are described in various forms such as 'bottom-of-the-pyramid' innovation and 'below-the-radar' innovation. Innovation along value chains is a key feature of these developments."

This write-up briefly presents these value-chain oriented projects in Asia, including strands of research that contributed to the development of these initiatives, the current stage of lesson-synthesising efforts and types of potential lessons that could be generated from the synthesis.

2. Value Chain-Oriented Projects: Evolution of Their Respective Approaches

The three RIU initiatives in Asia dealing with value chains follow three different approaches. One initiative in Nepal is adapting and adopting an approach — which was developed in a different geographical location and for a different commodity — to link vegetable growers to markets. The second initiative in India is trying to connect producers of under-utilised crops with the market through a multi-pronged approach that was based on components validated in different geographical locations and for different commodities. The third initiative centres on the fish seed value chain in Bangladesh and has adopted an approach developed in the same geographical location and for the same commodity. Details of the three initiatives are presented below:

Case 1: Developing the Fish Seed Value Chain in Bangladesh

Rangpur-Dinajpur Rural Services (RDRS) is an NGO that is working with a consortium of organisations in northern Bangladesh to put an approach called Decentralised (fish) Seed Production (DSP) into wider use. This approach is expected to decentralise fish fingerling production by bringing rice field farmers and seasonal pond owners into the fish-seed value chain. Making simple adjustments to their farming schedules to produce fish fingerlings is expected to increase the availability of quality fish fingerlings in the area. This approach was originally developed in the same region as part of a series of research and development initiatives over 10 years. In order to scale this approach out in a larger area, some innovations around fish-seed value chains were necessary. Different actors, independently and in consultation with each other, are currently involved in this.

Development of DSP in Bangladesh

Four bodies of independent research, not necessarily undertaken with logical connections, seem to have underpinned the development of DSP approach. These are:

- Research on cultivating fingerlings in *hapas* (captive breeding and growing) and its subsequent adaptation in different Southeast Asian countries
- Genetically-Improved Farmed Tilapia (GIFT) development (number of years of selective breeding from 8 different natural sources of tilapia) and its subsequent introduction into many Asian countries
- Rice field-based fish seed production and development of its value chain — participatory research by integrating local knowledge and researchers' findings and development of the capacity of the system
- Establishing beneficial impacts of DSP on the livelihoods of rice farmers, fingerling traders, environment, etc., and subsequent promotion through the media

The key stages in the development of DSP are presented in the following table:

Table 1. Timeline of Events that led to the Development of DSP in Bangladesh

Period	Significant event
	• Rice fields used to naturally contain fish and other aquatic life forms • There was local knowledge about fish seed production of common carp in ponds (collecting eggs using water hyacinth and stocking in newly-constructed ditches to produce hatchlings that grow to fry/fingerlings).
1980s	• Research work of AIT about cultivating fingerlings in *hapas* and spreading the success in Cambodia, Vietnam, Thailand and Laos through AIT's outreach project contributed to development of the Decentralised Seed Production concept.
1991	• On-farm trial on translocating common carp eggs with aquatic plants from ponds/ditches into rice fields to produce fingerling and use it for table fish production as part of Northwest Fisheries Extension Project (NFEP). The Department of Fisheries implemented the project between 1987 and 2001 with CARE, DAE and partner NGOs of CARE.
1994	• GIFT was introduced into Bangladesh by BFRI through ADB's DEGITA (Dissemination and Evaluation of Genetically Improved Tilapia in Asia) Project. Its focus was on performance trials to compare previous strains with the GIFT strain (on-station and on-farm trials). Production of GIFT seed in public and private hatcheries was promoted in order to supply farmers (mostly mono-sex seed). This was a centralised seed production system.
1999	• GIFT seed in production in rice fields trialled in farmer participatory experiments as part of PhD research (Asian Institute of Technology, Thailand) under NFEP, using ideas from research carried out in northern Vietnam • Following successful outcomes this was promoted in NW Bangladesh (8 districts) by CARE as part of the Inter-Fish Project (1995-2000)
2001-2005	• Promoted largely in NW areas by CARE under the GOInter-Fish project (2000-2005) with other stakeholders
2002	• Impacts/ scaling-up was studied by WorldFish Centre and the University of Stirling, UK as part of post-doctoral research • Follow-up impact studies conducted as part of additional PhD research from the University of Stirling
2003-2004	• WorldFish promoted DSP through their Decentralisation of Sustainable Aquaculture Project (DSAP) (2000-2006) with around 40 NGOs throughout Bangladesh — focus on awareness and training of NGO staff in DSP
2003	• DSP was promoted in Vietnam through the Support for Freshwater Aquaculture (SUFA) project in hilly areas of two northern provinces
2007-2009	• WorldFish promoted DSP with common carp, GIFT and carp in rice-fields through their Adivasi Fisheries Project in NW (Rangpur, Dinajpur and Jaypurhat District) and N (Sherpur and Netrokona District) Bangladesh

Knowledge that contributed to the development of the DSP approach could be traced back to a series of research and development efforts by the Asian Institute of Technology (AIT) to develop an appropriate hatchery system for low cost freshwater fish. AIT collaborated with the Worldfish Centre, Institute of Aquaculture of the University of Stirling, UK, local government departments and various NGOs in these efforts. As a result, technologies for tilapia in both commercial and small-holder situations (Little, 1989; Macintosh & Little, 1994, Hulata and Little, 2002), small carp such as the silver barb (*Puntius gonionotus*) (Djamanto, Little & Nietes, 1995; Kheang, 1994) and snakeskin gourami (Yoonpundh & Little, 1996, 1997; Yoonpundh, 1997) were developed or refined. Through their Aquaculture Outreach project, they promoted improved availability of quality fish seed at the farm gate. The initiative promoted different approaches to suit different conditions. For example, in Northeast Thailand, where small fry are available through well-developed trading networks, AIT introduced advanced nursing in *hapas* (fine mesh net cage) of their own fry to farmers. In Laos and Cambodia they institutionalised the development of simple hatchery, nursery and distribution systems (Haitook, 1997, Gregory & Little, 1997). Through such efforts, the importance and usefulness of seed production by farmers or seed production with greater involvement of farmers was established (Gregory, Innes-Taylor, Guttman and Little 1997).

Some research efforts have advanced the knowledge base about the complex and dynamic nature of freshwater fish seed production in the region. Key ones include the works of Surintaraseree (1988) and Middendorp & Verreth (1986) about carp and tilapia in NE Thailand; Hossain, (1995), Hassan, Edwards & Little (1996) and AIT Aqua Outreach (1997) about carp and tilapia in Bangladesh; Nguyen (1997) and Barman (1997) about carp and tilapia in Northern Vietnam and Northwest Bangladesh.

Box 1. Key Perceptions on Improving Fresh Water Seed Supply and Performance in Smallholder Aquatic Systems in Asia

(*Excerpts from final project report***)**

- The prevailing view that the major approach to improving the value of seed is primarily through improved genetic management is a misconception. Project outputs indicate that changes in management during production and delivery can have greater, more immediate, and, probably, more sustained impacts on the availability of quality seed for rural producers.
- The view that centralised government seed is of better quality and more reliable than that produced either by clusters of private hatcheries or, for some species and situations, local people in rural areas was challenged. The project has documented major impacts on poor livelihoods from the decentralised production of mixed sex Nile tilapia. High quality Nile tilapia is in high demand in northern Vietnam and Bangladesh and the project has disseminated important findings that should orientate policy towards this approach rather than an inappropriate high-tech, centralised mono-sex approach.
- Initial expectations by the project and its partners that seed quality could be improved through the development of appropriate tests were soon largely rejected as the complexity of the systems and the causes of poor quality were identified. A process-led approach was initiated, leading to key stakeholders viewing improvement in seed quality as a *process* rather than a *product.*

These advancements in knowledge formed the base for a research project on "Improving fresh water seed supply and performance in smallholder aquatic systems in Asia". This project was financed by DFID and implemented by a consortium comprising the University of Stirling, the Worldfish Center and AIT. The project served to clarify many perceptions and advanced knowledge about freshwater fish seed production in Asia. The key perceptions are presented in Box 1. More importantly, the project also elaborated the relevance of Decentralised (fish) Seed Production (DSP) approach in the area.

Case 2: Diversifying Incomes through Underused Crops in India

The International Centre for Underutilised Crops (ICUC) is implementing/ piloting a multi-pronged approach to promote underused crops in India. Different components of this approach were developed and evaluated in different geographical regions for different commodities. This approach is expected to result in innovations around value chains of underused crops and will connect small-holder producers of underused crops to wider markets. The approach has three essential components: 1) Village Crop Fairs 2) Community Germplasm Orchards and 3) Food Processing Parks. The Village Crop Fairs, organised periodically, are places where community members access information and discuss potential underused crops, as well as their production and utilisation. They also select germplasm of suitable crops. The Community Germplasm Orchards take suggestions from the crop fairs and multiply and maintain planting material of selected underused crops to supply interested producers. The Food Processing Parks are integrated resource centres where producers can access services for post-harvest, processing and marketing of these crops. These parks contain infrastructure for post-harvest operations, knowledge and information about all aspects of underused crops and facilitation services to connect producers with different service providers. Annual Knowledge Fairs at the project locations provide opportunities to showcase project initiatives to a diverse audience, conduct scaling up/out of activities and provide policy advocacy.

BAIF, which is ICUC's local Indian partner, has extensive experience in establishing horticulture/ forestry orchards in farmers' private lands through its *Wadi* programme and fruit processing facilities through its *Vrindavan* programme. The parks are based on experiences of the *Vrindavan* programme, while the *Wadi* programme experience informs the production of underused crops.

Development of the Approach

Initial Efforts through Knowledge Dissemination

Research and development efforts to unlock the potential of underused crops to support rural livelihoods have been a long-standing proposition by some sections of the intellectual community. ICUC was founded in 1992 by the University of Southampton, UK. In its early days it was mainly involved in farmers' participatory surveys, agronomic trials on production and post-harvest technologies, and publishing extension literature in local languages. It also promoted regional networks such as the Underutilised Tropical Fruits in Asia Network (UTFANET) and Southern and East Africa Network for Underutilised Crops (SEANEU) for wider dissemination of knowledge and information about underused crops.

The Forestry Research Programme (FRP) of DFID is another agency that had actively been promoting research and development initiatives concerning underused crops. Its initial efforts focused on supporting research projects to look into the use of dryzone hardwood to address fuel and fodder shortages in local rural communities. In the later stages, it supported research projects on locally important fruit trees, after identifying their potential role in supporting rural livelihoods. It collaborated with the International Centre for Research on Agro-Forestry (ICRAF) and supported initiatives to collect and synthesise scattered knowledge about major species of indigenous tropical and sub-tropical fruits into monographs, which are then widely distributed. It also supported research projects to determine the importance of such fruit trees to household and community livelihoods, and the constraints in increasing incomes or diminishing vulnerability through enhanced production, processing or marketing of fruits.

In 1996, a scientific conference at the University of Southampton, organised by ICUC, highlighted the need for developing monographs on key underused crops, which was reiterated in subsequent regional meetings by UTFANET, SEANUC and MESFIN. These suggestions prompted ICUC to develop a project proposal and approach FRP for financial support. Approval resulted in the Fruits for the Future Programme, which was implemented from 1998 to 2001 and included objectives such as: 1) production of 5 books, extension manuals/ pamphlets and annotated bibliography on selected species of tropical fruit tree biodiversity, culture, produce, post-harvest, and processing and marketing; 2) production of media materials and 3) disseminating technology to target institutions, including ICRAF, IPGRI, CIFOR, NGOs, farmer associations, extension officers, capacity building institutions, traders and industries.

In the same period FRP also supported projects like the ‘Wambui’ Project in Kenya (RNRRS-R7425), that expanded knowledge about packaging of information material for up-scaling. This small project also demonstrated that places of social interaction like churches can be better employed to convey messages.

At this stage the general assumption is that collating and disseminating knowledge about production and processing of underused crops would help toward putting that knowledge into use for the benefit of a community.

Increased Knowledge on Broader Engagement with Diverse Stakeholders

While implementing the Fruits for the Future Programme ICUC developed working relationships with implementing partners in different countries. These partners were primarily engaged in carrying out participatory surveys among farmers, collecting local knowledge and disseminating the extension material that was developed through the programme. Over this partnering period ICUC soon realised that making knowledge available addressed only one aspect of the problem. There were other constraints to promoting underused crops. These included: lack of free access to plant propagation material of required species; unavailability of post-harvest and processing technologies; and lack of linkages to markets and other service providers.

Supporting evidence from the research efforts of ICUC and its partners (Anthony & Haq 1997, Haq, 2000, ICUC 2000) and discussions during a regional consultation meeting (Haq & Hughes, 2002) indicated that the main challenge to promoting underused crops was the gap in information on current harvest and post-harvest handling methods and on processing and packaging technologies for underused fruit. They also found that these technologies had been developed by national research systems and were lying on laboratory shelves and out-of-reach of village-level processors and small-scale entrepreneurs. Moreover, technology developed by research stations needed to be evaluated and adapted for local suitability, as underused crops tend differ vastly from each other in terms of characteristics and applications, often in different regions of the same country.

The work of Vinning & Moody (1997) highlighted the problems faced by small-scale entrepreneurs. It concluded that their produce tended to be of low quality and hence difficult to market at a good price. Lack of business skills posed challenges in sustaining their ventures. Vinning and Moody also remarked that capacity building efforts needed to focus not only on technical know-how but also on understanding processes involved in changes in farming and marketing practices.

Based on lessons learnt, ICUC carried out a survey in 2002 among stakeholders in five countries — Bangladesh, India, Nepal, Sri Lanka and Vietnam — to understand the need for research to overcome these constraints. After an initial analysis of the survey results, ICUC carried out a series of discussion meetings with its network partners, involving community groups such as women and youth groups, village level producers, NGOs, researchers and small entrepreneurs in Bangladesh, Sri Lanka and India.

These consultations formed the basis for subsequent projects, such as the DFID-supported project on “Improved livelihoods through the development of small-scale fruit processing enterprises in Asia” (RNRRS-8399), in which ICUC built up capacities of local partners in producing and processing underused crops. These partners were then expected to help potential entrepreneurs set up production and processing facilities that would benefit producers of underused crops. In India, BAIF established three fruit processing facilities — or ‘resource centres’ — through self-help groups of small entrepreneurs. However, after some initial success, these fruit processing enterprises collapsed, due to a lack of business skills that prevented these small entrepreneurs accessing credit facilities, markets and raw material.

An RNRRRS research project on ‘farmers’ organisations for market access’ (RNRRS-R8275) — implemented between 2003-2005 in Malawi — generated better understanding of problems of farmer organisations and conditions required for their success. This project had its basis in years of research work carried out by Imperial College, London and the Agricultural Policy Research Unit (APRU) team of the University of Malawi under an ESCOR-funded research project on Pro-Poor Agricultural Growth. The ESCOR project had concluded that poor access to financial and input and output marketing services was a major constraint to pro-poor agricultural growth. It suggested that the development of these services in rural areas needed non-market

coordination mechanisms. Based on these, farmer organisations were considered as potential providers of such coordination.

In the current RIU initiative, the knowledge that was generated from all these previous efforts is being applied to promote a multi-pronged approach. To facilitate this initiative a Coalition to Diversify Income through Underused Crops (CODI) was promoted.

Table 2. Timeline of Significant Events in the Development of the Approach in India

Period	Significant Event
1980s	• BAIF collaborated with the Oxford Forestry Institute to implement research on hardwood species. FRP (DFID) supported these initiatives - Phase I – Collecting seeds from around the world - Phase II – Evaluating species for better qualities - Phase III – Promoting the most prospective ones, establishing seed production stands and introducting these in farmers' fields
1982	• The *Wadi* programme was started by BAIF in Valsad district of South Gujarat. This is basically an agro-forestry initiative in farmers' fields
1990s	• BAIF collaborated with ICUC by sharing local knowledge about underused crops • Jointly implemented the "Fruits for the Future" programme (1998-2001) involving production aspects of 3 underused crops (Tamarind, Ber and Amla). Training for farmers and NGO staff organised in three languages (Gujarati, Marathi and Kannada) about production technologies of these crops • In the next stage, posters and manuals generated around processing 3 underused crops (Tamarind, Amla and Jackfruit) in different languages (Kannada, Marathi, Hindi and English)
2002 2003	• Survey implemented by BAIF on "Processing and Marketing of Underutilised Crops In India"
2004 2006	• ICUC project on "Improved livelihoods through the development of small-scale fruit processing enterprises in Asia"
2004 2005	• Project on "Community Participatory Processing of Underutilised Fruit" was implemented in India, Sri Lanka, Bangladesh and Nepal • The project involved the identification of fruit and potential processed products; training project personnel on processing selected products; producing and distributing manuals and posters as extension material; establishing processing resource centres; identifying and training beneficiaries; processing activity taken up by beneficiaries as small-scale enterprises; creating marketing linkages and conducting marketing surveys; building capacity of beneficiaries with additional orientation towards entrepreneurship development
2003 July	• BAIF staff were trained at IIHR on processing technologies
2005 Sept.	• National workshop on "Underutilised Fruit Species for Food-Nutrition Security and Enhanced Rural Livelihoods" was organised by BAIF with

	participants from India, Nepal, Bangladesh and Vietnam
2006	• Value chain analysis by BAIF for Amla (Emblica officinalis), Tamarind (Tamarindus Indica) and Kokum (Garcinia Indica)

Case 3: Linking Vegetable Growers with Markets in Nepal

International Development Enterprises (IDE), Nepal, is putting into use the Participatory Market Chain Approach (PMCA) to link vegetable growers with wider markets. This approach was originally developed in a different location for a different commodity.

IDE Nepal's Activities Leading to Application of PMCA

Since the early 1990s IDE Nepal's key activities have been about participatory research to develop and provide appropriate micro-irrigation technologies such as drip systems, micro sprinklers, treadle pumps (manual foot pumps), and water storage/ distribution technologies. Through these activities it earned the trust of farmers and rural communities. Based on demand and perceived opportunities over time IDE Nepal also developed and provided appropriate agricultural equipment for coffee processing, essential oil distillation, and for a variety of high value sub-sectors such as spices/herbs, non-timber forest products (NTFPs), livestock, and fisheries. IDE Nepal also recognised the tremendous potential for poor farmers in Nepal to rapidly increase their incomes by supplying some of these high-value agriculture produce, especially vegetables, to national and international markets. However, it also realised the challenges it faced — disorganised nature of small farmers and inefficiency in the existing value chain for vegetables, characterised by missing actors and insufficient connections among actors.

In order to address these constraints and support small farmers to play an effective role in vegetable markets, IDE Nepal promoted community-managed collection centres (CMCC) for vegetables, which serve as a point of aggregation of vegetables to attract local traders. IDE has developed and refined a methodology to promote these centres. It successfully developed about 100 centres to benefit about 100,000 families. The Marketing and Planning Committees (MPCs) that run these centres provide a range of services to member farmers and represent them while negotiating price with traders.

Successful implementation of these initiatives encouraged both IDE and the marketing committees to expand their scope to further their interventions in the value chain and access national and international markets. However, the committees lacked necessary capacities and skills to do so. While exploring opportunities to address this constraint, IDE came across the PMCA as a useful methodology to move to the next level of market operations. Through this methodology, management capacities of the marketing committees were expected to be built up to respond to different types of market opportunities and facilitate them to build more advanced market linkages to capture more remunerative markets (including domestic agro-business and specialty markets that require quality, and eventually lead up to exports to India).

Development of Participatory Market Chain Approach

Active participation of small-holder producers in markets is the most desirable outcome in efforts to address poverty among farming households. To realise this many research

and development efforts have proposed different approaches/ methodologies. The PCMA is a relatively recent approach, developed by the Papa Andina programme, anchored by the International Potato Centre (CIP) in the Andes highlands of Latin America.

Papa Andina is a regional programme initiative of CIP with activities spread out in Bolivia, Ecuador and Peru. It started operations in 1998 with the main aim of improving the welfare of low-income potato farmers. Initial activities focused on improving production and productivity through technological solutions. However, marketing issues prevented any improvement in production. In order to address this situation, Papa Andina began exploring ways of improving participation of small-holder farmers in market chains (Douglas Horton et. al., 2009). It joined hands with another CIP initiative in Peru called Project for Potato Innovation and Competitiveness in Peru (INCOPA Project) with similar objectives and started using Rapid Appraisal of Agriculture Knowledge Systems (RAAKS) methodology developed by Engel and Salomon (2003) in the context of market chains. They used RAAKS in conjunction with other participatory approaches such as rapid market assessment and focus groups. This gradually evolved into a new approach called PMCA (Douglas Horton et. al., 2009; Bernet, Thiele and Zschocke, 2006), which proved successful in meeting programme objectives. Relationships among market chain actors and R&D professionals improved as a result of this approach and triggered the development of new products. In 2003, when the INCOPA market chain work was reviewed in an Andean regional workshop, participants from Bolivia grew interested in the approach and began experimenting with it. Over the next few years, PMCA was further developed and documented, based on the work in Bolivia and Peru (Devaux et al., 2009).

In 2005, Papa Andina, through another DFID-financed project on 'Promotion and development of PMCA in Uganda', collaborated with ASARECA and local partners to introduce PMCA to Uganda in commodity chains for potato, sweet potato, tomato and hot pepper. Since 2007 new applications of PMCA have started in Bolivia, Peru and Colombia through the Andean Change programme (Allianza Cambio Andino)[1]. Papa Andina is also coordinating application of the approach in potatoes in Indonesia.

3. Nature of Potential Lessons Synthesised: Current Stage

The nature of lessons generated by studying these three value chain-oriented initiatives is expected to be sufficiently generic to be applicable to a wide range of initiatives, but still sufficiently specific to provide some useful guidance for future projects. However, lessons would focus on the characteristics of the process involved in putting value chain-oriented knowledge into use and the approaches adopted.

An Innovation Systems framework is being applied to investigate the type of actors involved, their configurations and different ways of building those configurations, nature of linkages among different actors, and institutions and policies that support/ challenge

[1] The Andean Change programme, also known as "National Agricultural Innovation Systems that Work for the Poor: Building on the Bolivian Experience" or "Allianza Cambio Andino" is a four-year programme (2006 to 2010), implemented by the International Center for Tropical Agriculture (CIAT) in collaboration with CIP.

these initiatives. These investigations would provide useful ideas for promoting Opportunity-Led Innovations involving large numbers of resource-poor people.

Initial contacts have been established with respective project implementing teams. Information regarding the historical evolution of current stage events and strands of research that underpinned development of these approaches have been collected and corroborated. There will also be a continuous analysis of activities in the field and comparisons to draw generic lessons.

There are preliminary indications that these three projects have important similarities and differences, and thus provide opportunities for some useful lessons. The following are some of the observations at this stage:

- Different research outputs get appropriately mixed with process components before being successfully applied in the field situation. It could only happen through a multi-actor involvement and after many iterations and feedback loops.
- Even proven approaches in other areas need further adaptations by different actors to fit to their specific context. Many actors need to engage themselves, act according to their priorities and cooperate for the successful scaling-up/out of these proven approaches. Some agencies need to play the coordination/ facilitation/ mediation role to enable this. Generic features of such agencies could be identified.
- If there is a clear market opportunity and a fairly well-developed value chain, different stakeholders adopt newer knowledge, innovate and contribute for wider application of that knowledge.
- The DSP approach was developed in the same region for the same commodity. Current efforts are focused on scaling up and out to spread impacts in a wider area. The PMC approach was developed in a different geographical region for a different commodity. Project implementers are trying to customise PMCA to suit the local situation and commodities. Another underused crop initiative is applying an approach with different components validated in different geographic regions for different commodities. Project implementers here are continuously developing the approach to fit the local situations.
- DSP is simple and can easily be adopted by primary stakeholders with minimum adjustments to their existing situations. PMC requires greater external facilitation by and role for different actors in order to be successful. Its approach to underused crops needs the creation of new infrastructures and skills. However, primary stakeholder level interventions are simple and easily practiced.
- DSP directly addresses serious problems faced by the fishery industry/ system. It offers direct economic benefits to many of its stakeholders. Promotion of underused crops is a felt need, mostly by secondary stakeholders. Producers need to be promoted, as do their backward and forward linkages. The market for such crops also needs to be built. As a result, it could be a long time before success is achieved. PMC provides primary stakeholders an opportunity to raise income-levels by accessing higher-value markets. Certain new skills need to be built. This

also requires significant amount of external facilitation/ mediation with value chain actors.