WORKSHOP REPORT

BASIN FOCAL PROJECT: REVIEW AND PLANNING

CGIAR Challenge Program on WATER & FOOD

The Challenge Program on Water and Food

1-5 February, 2008

CIAT, Cali, Colombia

SUMMARY

The Basin Focal Projects (BFPs) of the Challenge Program on Water and Food (CPWF), conducted a review and planning meeting at the International Centre for Tropical Agriculture (CIAT), Cali, Colombia from February 1-5, 2008. The objective of the meeting was to review results of the first set of BFPs (Volta, Mekong, Sao Francisco and Karkheh) and research plans of the second set of BFPs (Yellow River, Niger, Andean System, Indo-Ganges, Limpopo and Nile). The meeting was also designed to facilitate interaction between BFP1s and BFP2s. More than 40 scientists representing several institutions participated in the meeting. Special methodology topics were also presented[1] and discussed. Major insights from the meeting were:

- **Consider the development context:** Water and agriculture cannot be considered independently of the development processes that affect them. Change in rural activities cannot be undertood without considering non-rural activities.
- **Water influences livelihoods through the agricultural system**: The agricultural system responds to demands placed on it.
- **Water and agriculture are not mixed**: Experiences in basins suggest change instruments are directed at either water or agriculture but not both.
- **Multiple uses in basins:** Analysis of water use at basin scale highlights the importance of multiple uses. Initial analysis suggests that grassland dominates water use in all African basins. This increases the apparnet importance of livestock.
- **Change:** Impact pathways emphasis the supply side of change. Basin focal projects emphasise the demand side of change.

DAY 1:

Approaches and experiences from the first found of Basin Focal Projects

The interim Director General of the International Centre for Tropical Agriculture (CIAT), Dr Geoff Hawtin opened the session. He welcomed the participants to CIAT and emphasised the importance of Basin Focal Projects within the CPWF. Following this, presentations were made for the Karkheh, Sao Francisco, Volta and Mekong basins[1]. Outcomes from these basins are detailed under four subheads.

Poverty, migration and rural transformation*:* In three of four BPF1 basins, teams found that links among water, food security and poverty were best understood in an historical perspective. In these basins, rural societies are undergoing major transformations – in which water and agriculture typically do not play central roles.

In the Karkheh basin, poverty rates have declined – largely because of rural to urban migration and broader national poverty reduction strategies. Poverty in rural areas is less than in urban, while poverty in rainfed areas is less than in irrigated. Water x food x poverty links were not found to be strong, and non-agricultural interventions appear to be most promising means of further reducing

[1] Presentations can be downloaded from www.bluedocs.org or http://basinfocalprojects.pbwiki.com

poverty. In the Sao Francisco basin, poverty rates have also declined. Here, however, water and agriculture appear to play a stronger role. There has been a strong out-migration of smallholder farm families, some to urban areas but others to seek jobs in large commercial farms that increasingly are specializing in high value crops for export. Water x food x poverty links are in part related to employment opportunities and wage rates in large farms, and the extent to which commercial high value crops require irrigation. In the Mekong basin, the shape of rural transformation varies by country and in some instances within countries. In northeast Thailand, poverty rates are declining as people take advantage of income-earning opportunities in rapidly growing urban centers such as Bangkok. Agriculture in the northeast is becoming less important in livelihood strategies. In contrast, water and agriculture remain very important for poor farmers in the hillsides of Laos, or for fisher families near the Tonle Sap in Cambodia. In the Volta basin, the transformation of rural society is proceeding more slowly. Farming and livestock herding remain fundamental to the livelihoods of the rural poor, and water scarcity and food security are closely linked. Rural to urban migration is important, but does not yet offer a major route out of poverty. Past success in increasing food production has come more from area expansion than yield increase, and there are concerns about how to meet future food demands for a growing population.

Diversification, intensification and food security: Diversification and intensification in agriculture have taken very different forms in each of the four BFP1 basins.

In the Sao Francisco basin, agriculture appears to be shifting away from staple grain production by smallholders towards intensive production of high value crops by large commercial farmers. In the Mekong basin, there has been some diversification and intensification of agriculture, especially in areas near urban markets. However, there are also large areas of low productivity semi-subsistence rice and other staple food crops.

In some instances, agriculture has suffered from neglect as livelihood strategies have become more dependent on off-farm and non-agricultural income. In the Karkheh basin, in contrast, diversification out of wheat and other staple grains is actively discouraged by government policies that perceive domestic food production and national food self-sufficiency as an important element of national security. Finally, in the Volta, processes of diversification and intensification proceed relatively slowly, held back by a lack of marketing opportunities, high input prices – and water scarcity. Some suggest that the approach used to foster expansion of commercial cotton production might also be used for other crops.

Water poverty: BFP teams disagreed on the extent to which the notion of "water poverty" is helpful.

In the Karkheh basin, the concept was not found to be very useful. Poverty reduction in that basin has had little to do with water and a lot to do with migration and national policy. And, curiously, people with less water (such as rainfed farmers) are less poor than people with more water (such as irrigated farmers, or urban inhabitants). In the Mekong, the basin team found that there are innumerable ways to characterize "poverty" and "water problems" (scarcity, excess) and that different patterns of "water poverty" emerge when indicators are combined in different ways. Trying

to tie all of this up into a single measure does not seem the right way to go. In the Sao Francisco basin, rural poverty was found to be linked to water scarcity, in the sense that rainfed farmers are far poorer than those who invest in irrigation. The truly wealthy are those who have had success in developing large-scale, irrigated farms for the production of high value crops. Finally, in the Volta basin, water scarcity and poverty were closely linked, and strategies for poverty reduction typically incorporate some element of improved water management.

Water availability and water productivity: Despite some differences, there was considerable similarity across basins on how water availability and water productivity were measured, and how these measurements were used. In all cases, simple water accounting tools were found to be helpful. These show the volume and proportion of water that goes to irrigation, rainfed farming, grasslands, run-off, and so on, at different locations in the basin.

In general, it was shown that water productivity tends to be lower in wetter areas than in drier areas. Water productivity in irrigated areas in the Karkheh basin, for example, was lower than in rainfed areas. In that basin, there is some interest in using spatial mapping of water productivity to ascertain whether practices used in high productivity areas might be suitable for lower productivity areas. Integration of livestock with crop production resulted in particularly high levels of water productivity. In the Volta basin, water productivity tended to increase as rainfall dropped off. In the Sao Francisco basin, in contrast, water productivity was treated as a relatively minor endogenous variable, merely one of many outputs of modeling exercises. A greater emphasis was placed on labor productivity as a performance indicator. And in the Mekong basin, where water is relatively abundant throughout the basin, the concept of water productivity was thought to be less compelling than that of competition for water, especially when increased use of water to generate hydropower may have negative effects on downstream fisheries.

Issues and interventions: Most BFP teams appeared to have, for their respective basins, a good sense of important issues related to water and food, and some approaches to addressing them. Varying levels of progress have been made, however, in analyzing and evaluating the likely consequences of different intervention scenarios.

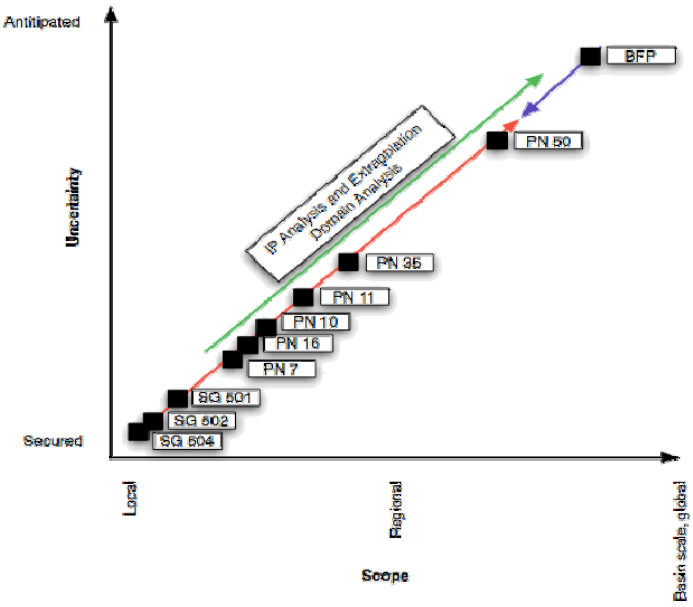
In the Karkheh basin, major water related issues include siltation of irrigation infrastructure, salinization of irrigated land, low water productivity in irrigated agriculture, and effects of upstream water management on downstream marsh ecosystems. Potential interventions include land and water conservation in rainfed areas, improved practices for managing irrigated fields, and improved water productivity in rainfed areas by tapping existing spatial variation in water productivity. Poverty and food security issues tend to be addressed through interventions (such as food subsidies) unrelated to water scarcity or water management. In the Sao Francisco basin, emphasis was placed on a hypothetical future crisis – the basin "closing" (that is, the river drying up before reaching the sea) because of excessive extraction of river water for irrigation. Interventions studied by the team include a range of policy instruments for controlling water use in agriculture, for example, water pricing or restricting the amount of water available for irrigation. Potential interventions to reduce poverty include policies to support smallholder investment in market-oriented, diversified

production of high value crops. In the Mekong basin, a major issue is that of hydropower development, and possible consequences for downstream fisheries, especially in the Tonle Sap. Other issues include chronically low water productivity in irrigated rice production, and salt intrusion in coastal areas. Potential interventions include stakeholder dialogue on water allocation (informed by research) that takes account of all water users, including fishers. Finally, in the Volta basin, major issues are those focused squarely on water scarcity and food production for food security. Potential interventions include water harvesting and related field-level practices, and the further development of small multiple-purpose reservoirs – with an eye, however, to the downstream consequences for Lake Volta and the Akosombo dam of any substantial diversion of water into small reservoirs.

DAY 2

Research plans of the second round of Basin Focal Projects

Kim Geheb presented on institutional analysis; mostly on partnerships and impact; CP projects should fit in with BFPs; two way interaction; BFPs help define the change we want; impact pathways a positive change in behaviour; partnerships tend to be next users rather than end users; end users are ultimate targets.



Following this, BFP leaders presented research plans and major issues in their respective basins. Presentations were made for the Limpopo, Yellow River, Indo-Ganges, Niger, Nile and Andean Systems, in that order. A panel of 3, critically reviewed research plans of each basin and recommendations were made to improve outputs. Special topics such as Knowledge Sharing, Hydro-economic modelling and water productivity were also presented and discussed.

Limpopo Basin: Described partners and who does which work package. In this basin, water interventions are likely to be important but not necessarily agricultural water interventions. Access to water is more important than water productivity. Highly variable rainfall and lots of mining activities

are pointed out as major issues. Another key issue is that non agricultural uses have high returns, and therefore need discussion on Challenge Program position on encouraging non-agricultural water uses. Outcomes of interventions depend on policy and institutional environment which need practical packages of interventions that combine institutional and policy innovations. Emphasis was placed on reaching out to stakeholders and impact pathways and stakeholder analysis to evaluate different packages of interventions. Information management is also considered as key in this basin.

Panel comment

1: (Sam Fujisaka) **Is poverty in agriculture important?;** what might be some agricultural water management packages?; 50-60% rural below the poverty line; varies by country; Botswana more work in cities; South Africa big commercial farms take most of the agricultural water in the basin, vs. ex homeland areas; reallocation 5% of commercial water to small scale gardens in homelands, would make big difference in food security and child nutrition; how to improve equity of water use without undermining successful commercial farming and mining?; agricultural water management packages could be drip irrigation, treadle pumps successful but need support systems and local industry; multiple use systems maybe.

2 (Flip Wester) **Multiplier effect of water use** in agriculture when comparing water value vs. industry? Employment generation and so on; agricultural water management still important?; note water for mining and smelting produces taxes used for social services, means turns out very difficult how to compare water productivity across uses;

3 (Eva Rathgeber) **Complexity of partnerships** and difficulty of management; disease effects; electricity crisis; most team members have already worked together; not much hydropower being used or even planned

Yellow River Basin: Partners and work package details were presented. Hydrology model will be used from the YRCC. Yellow river commission has no mandate related to poverty and therefore, socio-economic data availability may limit poverty mapping [at house hold level]. Poverty line at the national level also does not take account of different food prices. Water and food challenges include urbanisation and industry, more water allocation to the environment, sediment flushing and upstream livestock.

Panel Comments

1 Eva Rathgeber; Needs **on the ground information** (?) gender issues; possible to bring in other agencies that do work re poor (?); Liz; how to get access to data from CP projects, at least meet; need to link better with second call projects; not planned to have meetings between BFPs and CP projects;

2 Flip Wester; wishes to know more about **poverty mapping**; discuss in open space?

3 Sam Fujisaka; **12m ha of cultivated area**; no till coordinates with RWC; what about heavy metal pollution, try bio-remediation small project (?); Mac; how to handle groundwater in hydrology (?);

YRCC not so much concerned; use existing data; not focus on groundwater depletion; Simon; big gain if province level water allocation renegotiated; what about rainfed (?); not sure;

Indo-Ganges Basin: With more than ¾ billion people of which 30% poor, this basin is large and complex. Complexity is added by sub basins which are distinct from each other. 90% of water in this basin is used for agriculture. Work package detailed data availability issues. This basin is taking a sub-basin approach depending on data availability. Panel questioned how and why Indus and Ganges basins are combined? It is recommended that CPWF should address this question. Rain fed low land rice areas in the eastern India is suggested to include while addressing poverty. How will many small sub-basin studies be integrated and synthesized at the end for a fuller picture? This needs careful thinking. Too much data may also be a problem, not insufficiency.

Panel recommended that sub-basin selection to be made depending on data availability or water related poverty. In response, the basin leader said, sub-basin selection to be made depending on data availability especially water flow data.

Niger Basin: This basin is located amongst most poor of all countries. Population is highly rural. Work package (WP) 1 to use the following approaches-water poverty index, livelihood mapping, climate change vulnerability, Gini coefficient and human development index. WP 2 and 3 to look closely at sub-basins, including livestock. WP4 includes analysis of how institution affects sustainable water use. Stake holder workshops and modelling with WEAP and PODIUMSIM were included in WP5. Websites and GIS layers with Google Earth were described in work package 6.

Panel suggested that livelihood indicators need to be disaggregated by gender. Bilingual information management (English and French) was appreciated. Lack of intervention analysis in each of the sub-basins-upper reaches, inland delta, and main delta was noted by the panel.

Nile Basin: Upstream vs. downstream issues; potential for hydropower, irrigation potential, improve rainfed farming, flood defense, water savings and increased water productivity; water issues (drought and flood affected population) drive food imports; slow transition out of agriculture except Egypt; irrigation potential for Ethiopia and Tanzania (also DRC); balance between level of detail and overall basin project; inception workshop; basin tour; detailed study sites recommendations; see PPT for WP content; BFP for problem definition;

Panel comments:

1 Flip Wester; Conflict war **threat** if Ethiopia builds dams? Now more on benefit sharing from hydropower; now large investments underway in planning development projects; Benefit sharing the big issue (?); Eva Rathgeber; references to past work by IDRC and FAO; Francis; note importance of fisheries in lakes and swamps;

Andean Basin:

[Notes missing]

DAY 3

Day 3 took first cut at Phase 2 research questions of the CPWF, as seen by basin teams.

Started with a brief presentation of the Topics as developed by Theme Leaders, then basin teams were allowed to develop research questions as they understood them. (This was a departure from the process developed by the Impact Pathway team).

Results

Andean System of Basins

Research Question 1: What kinds of benefit-sharing mechanisms, including cultural and social considerations, work best in different socio-economic, biophysical and institutional environments?

In many parts of the Andes, water is not particularly scarce. Poor people, however, often have limited access to this water. The issue is one of sharing water – or, when this is awkward, one of sharing benefits. Water management interventions can help reduce poverty by improving the access of poor people to water resources, by improving the productivity with which they use water – or, less conventionally, by providing them with financial compensation for increasing the quantity and enhancing the quality of water available for downstream communities.

This latter option – payment for environmental services or PES – is of special interest in the Andean system of basins. Research on PES has resulted in a greater appreciation of the potential for conservation agriculture and agroforestry systems to reduce negative externalities. When farm-level, near-term benefits to farmers are high, spontaneous adoption can be anticipated. In other cases, however, the importance of social and environmental benefits might justify providing farmers with incentives to adopt, that is through mechanisms of payment for environmental services.

Ganges Basin[2]

Research question 1: How can productivity on sodic and saline soils be increased, and what is the potential for aerobic rice?

Sodicity in the irrigated Indus and western Ganges, and salinity in the eastern Ganges and coastal regions, are major problems. In India alone 9.05 million hectares of farm land are affected by salinity and sodicity. Different research institutions in the basin have developed management strategies for

[2] A maximum of two research questions will need to be defined for this basin, through the work of basin advisory panels and topic working groups.

these soils. Building on these strategies, the further development of salt tolerant crop varieties and improvements in management practices will result in productive utilization of otherwise barren soils, better resource use efficiency, and improved livelihoods for large numbers of rural poor. Research is needed on the longer-term consequences for soil quality of widespread use of such practices.

Rice is the major crop in the Indo-Gangetic Basin. Technologies capable of reducing water use in rice production have the potential to save enormous amounts of irrigation water. Aerobic rice systems comprise one such technology. Research is needed on how to adapt aerobic rice germplasm to the local environment; how to best manage aerobic rice under farmers' conditions (including their likely different strategies in "wet" and "dry" years; what are possible consequences over time for soil fertility, nutrient availability and soil biology; and what happens to downstream water availability and access when less irrigation water is used upstream.

Research question 3: What are water quality and quantity requirements and trade-offs for different uses (e.g. livestock, fisheries, crops, and urban and industrial uses)? How can they be accomodated – technologically and managerially – in water storage and delivery systems?

Water systems designed and managed for multiple uses have the potential to increase water productivity, increase per capita water availability, and improve food and environmental security throughout the Ganges basin. In the western Ganges, opportunities lie in introducing multiple use practices in irrigation systems. In the eastern Ganges, the focus of Phase 2 research, there are important opportunities to improve productivity and profitability in rainfed waterlogged areas.

Limpopo Basin[3]

Research Question 1: How to maximize the benefits of improved rainwater management?

Rainfed smallholder subsistence agriculture is important for the livelihoods of large numbers of rural poor in the Limpopo basin. Average annual rainfall in the basin ranges from 200 to 1,200 mm. It tends to be highly variable, unreliable, and inefficiently used. Many areas are routinely food deficient and rely on food aid. Large scale irrigation is restricted, with little scope for expansion. In dry years, water flows in the main reaches of the Limpopo for less than 40 days (Mgonja and Waddington 2006). Even in normal years, it does not flow throughout the year. The area developed for irrigation in South Africa (198,000 ha) already exceeds the estimated potential irrigable area (137,000 ha) (Louw and Liebenberg 2006), although many irrigation schemes are in disrepair.

Research is needed to further develop options for rainwater harvesting and conservation; identify where in the basin different options are most suitable; identify complementary farming practices (like soil fertility management) to accompany rainwater harvesting; foster institutional and policy

[3] A maximum of two research questions will need to be defined for this basin, through the work of basin advisory panels and topic working groups.

changes to facilitate adoption; and evaluate the likely consequences for downstream water users and uses of increased rainwater harvesting upstream.

Research Question 2: What are the water quality and quantity requirements and trade-offs for different uses (e.g. livestock, fisheries, crops, mining, urban and industrial uses) and how can they be accommodated in water storage and delivery systems?

A major problem in the Limpopo basin is water quality. Principal sources of pollution include high density urban areas, and mining and other industrial uses. The Olifants River, one of the tributaries from the South Africa side, is a particularly important source of pollution. Different water users and uses (agriculture, livestock, fisheries, direct urban consumption, environmental flows) are affected differently by poor water quality. Research is needed on trade-offs among water users and uses, as affected by quality. The results of such research will be used to inform policy debate and enhance dialogue in the basin on patterns of water use.

Nile Basin

Research Question 1: How to maximize the benefits of improved rainwater management?

Irrigated agriculture is the major water user in both Egypt and Sudan, with over 5.5 million hectares under irrigation. Ethiopia has a (largely unused) potential for 100,000 ha of perennial irrigation and 165,000 ha of small-scale seasonal irrigation. The other riparian countries have little potential for irrigation in the basin and depend almost completely on rain-fed agriculture, hence the importance of this research question.

All Nile basin countries, with the exceptions of Egypt and Uganda, had lower per capita food and agricultural production indexes compared to 1982. In Rwanda, Sudan, Tanzania and Ethiopia, deterioration in food security is especially marked. Access to high-quality water is likely to lead to a conflict in a situation where the availability of freshwater per capita is decreasing rapidly. Some basin countries are experiencing acute water stress during a large part of the year. In many places, the current water budget shows that the annual water demand exceeds the available fresh water.

Rain-fed agriculture dominates both in high rainfall areas and the semiarid savannah belt. In both areas, research is needed to improve the productivity of rainfall, and to make farming systems more productive and profitable. Water harvesting practices, combined with the introduction of drought tolerant germplasm and improved soil fertility management, offer one set of solutions. Better integration of crops, fishing and livestock in farming systems offers another. Both of these were explored in CPWF Phase 1 through PN2 and PN37; the outputs of these projects serve as a foundation on which Phase 2 research can be built. The research is expected to focus on the Ethiopian highlands, studying downstream effects in Sudan and Egypt and thus developing further the work of project 19 (Blue Nile upstream-downstream relationships)

Volta Basin

Research Question 1: How to maximize the benefits of improved rainwater management?

The Volta basin is largely populated by resource-poor farmers who rely on rain-fed agriculture for their livelihoods. Less than one percent of cultivated area is irrigated. Crop yields are low: maize yields range from 0.8 to around 2.0 t/ha, according to rainfall level and soil quality. Even where average annual rainfall appears adequate for cropping, its uneven distribution leads to high risk of crop loss, which in turn discourages farmers from using fertilizers. During the past 30 years, rainfall has become more erratic and unreliable, and cropping seasons have become shorter.

The clear imperative for agriculture in the Volta basin is to increase the productivity of rainfed systems in the face of moderate to severe drought risks, low soil fertility and institutional obstacles. There are opportunities to achieve this: through the introduction and adaptation of conservation agriculture and in-field water harvesting accompanied by improved soil fertility management, and investment in water infrastructure such as dugouts and small reservoirs. These are particularly common in Burkina Faso and, increasingly, in northern Ghana. Phase 2 research on these topics can build on the achievements of Phase 1 projects in this basin, for example PN5, 6, and PN46.

Multiple-use crop-livestock systems dominate the northern part of the basin. At first sight, water productivity in these systems appears low. Research by Basin Focal Projects (in those basins that have had active BFPs for the past 2 years), however, found that water productivity can be surprisingly high when crop residues for livestock are taken into account.

Feed and water transfers result in substantial productivity gains at relatively low levels of risk. Ways to sustainably improve the productivity of these systems must be sought. This will require that attention be paid to issues of land tenure, tensions between farmers and herders, and ubiquitous processes of land degradation.

Research Question 2: What is needed technically and institutionally for MUS to improve livelihoods and ecosystem resilience?

The Volta basin has a majority of the poor living in semi-arid and increasingly variable climates. It is clear that diversification of livelihoods and protection of ecosystems could build resilience, but important questions remain: How do you manage the balance between storage (needed for fish, domestic use in dry season) versus releases for peak irrigation season? How to manage water quality issues, including what quality standards each use needs, but also what pollution each produces and how to minimize the interactions? What infrastructure is needed (e.g. bathing/washing facilities, separate livestock watering troughs, etc.), and how much extra does this cost?

Global change issues in all basins

Organizing Cross-Basin Research on Topics

Although the principal aim of the CPWF in Phase 2 is to help define and address critical problems and challenges in basins, a structure working only at the basin level cannot be entirely satisfactory. Wholly independent Basin Teams might struggle unnecessarily with research issues already resolved by other Teams. Furthermore, cross-basin learning creates knowledge that is important across several of the six basins and is extrapolable to other basins beyond the CPWF set of six.

CPWF Phase 2 will feature two kinds of cross-basin research and synthesis: on priority topics and on impacts (ways to transform research outputs to development outcomes). As noted above, cross-basin research and synthesis aims to improve the effectiveness of basin-level research, and to authenticate and make available a wide range of international public goods. One mechanism for fostering cross-basin research and synthesis is the use of working groups, with members drawn from different basins. The other mechanism is for Basin Teams to be supervised by Program level science and impact specialists.

All basins have expressed a need for better understanding of global scale processes, especially climate change, but others as well, in order to improve resilience for the poor and ecosystems. As such, this will be a cross-basin topic, which would ideally include all basins from Phase 1. In each basin, this issue was included in the priority concerns expressed.This area of research is an important niche for CPWF. While the research questions will vary by basin and via the process described in Section 3, here are some of the issues currently raised in basins.

Research question 1: What will be the impact of climate change on vulnerability of food systems and ecosystems, and their mitigation and adaptation strategies?

An enormously important issue across all basins, but particularly the Ganges, Mekong and Nile, is the likely effect of climate change on food and environmental security. Climate change may lead to higher temperatures and greater variability and/ or reduced levels of rainfall. These will affect the yields of such crops as rice, wheat, maize and pulses, with unknown consequences for food prices and food security. Water resources available for irrigation may decline, while inundation effects from rising sea levels will have catastrophic effects on littoral countries, particularly Bangladesh.

Research Question 2: Which key drivers of change, including climate change, biofuels and trade policies, are of most importance, and what complementary sets of policies and investments would be most effective to mitigate adverse and enhance positive impacts?

Global change processes are likely to have enormous consequences for agriculture, ecosystems and rural livelihoods, especially in the Limpopo, Nile and Volta basin. Much of the area in these basins is drought-prone, with a semi-arid climate. Many soils have a low moisture-holding capacity and much of the rain that does fall runs off. While this increases stream flow in the main reaches, it can also cause floods in the lower reaches of the basin, destroying lives and livelihoods in their wake. Improved management practices, above and beyond rainwater harvesting as discussed above, coupled with policies that would enhance coping mechanism for the communities in the basin could aid in the adaptation to these adverse effects.

Research Question 3: How does research achieve developmental outcomes and impacts (for different types of research output in different contexts) and what partners are necessary at different levels to achieve impact?

Research is needed to understand institutional congruence and the role of partnerships in scaling up and out processes. Learning from projects' and the program's experiences will build the CPWF's capacity to carry out research for significant development impact in basins.

DAY 4 & 5

Impact Pathways

Reported separately