INTERNATIONAL COTTON ADVISORY COMMITTEE
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Report of a Meeting of the Expert Panel on Social, Environmental and Economic Performance (SEEP) of Cotton Production
September 29, 2013
Cartagena de Indias - Colombia

Members Present: Allan William (Chair), Fatih Dogan, Denilson Galbero Guedes, Michel Fok, Kater Hake, Elke Hortmeyer, B.K. Mishra, Bill Norman, Jens Soth, and Wilfried Yameogo,

Members Absent: Yu Ta Dolphin, Francesca Mancini (Uwe Grewer, FAO, attended in her place).

Observers: S.S. Das (Ministry of Textiles, India), Fatma Abdalla (The Sudan Cotton Company), Wolfgang Bertenbreiter (GIZ/COMPACI), Leon Picon (Turkish Textile Employers Association), Neal Gillen (ICAC Secretariat), Jose Sette (ICAC Secretariat), Kevin Latner (Cotton Council International), Peter Ottesen (Australian Government), Ioulia Drossinou (Greek Ministry of Rural Development and Food), Rebecca Pandolph (ICAC Secretariat), Axel Drieling (Bremen Fiber Institute).

Alejandro Plastina served as Secretariat.

Next Meeting:
The next conference call is to be arranged. The next face-to-face meeting could potentially be conducted during the 32nd International Cotton Conference in Bremen, on March 19-21, 2014.

Report of the Meeting

Agenda:

1. Approval of the Agenda
2. Finalizing the indicators report
3. Recommendations and next steps
4. Zambia pesticide data
5. Water management in India

1. Approval of the Agenda.
The preliminary agenda was adopted.
Mr. Fatih Dogan announced that he was stepping down from SEEP and that this was his last meeting. He introduced the person that he would be nominating to the Turkish Government as his successor, Mr. Leon Picon.

2. Finalizing the indicators report:

The Final Report "Measuring Sustainability in Cotton Production Systems" will be published in 2014, after a careful editorial revision. The multiplicity of authors and the varying degrees to which sustainability topics are covered throughout the Report present an additional challenge to the technical editorial work conducted by Allan Williams and Francesca Mancini.

It was agreed that the Report of SEEP to the Plenary Meeting, scheduled to be presented during the Second Open Session (Tuesday at 9:00 am), will focus on the role of indices and measuring tools as marketing strategies, the need to understand those tools used by brands and retailers in making purchasing decisions

and the process by which the list of recommended indicators was developed. It will not focus on describing the recommended indicators, there being too many to discuss in any meaningful way during the presentation.

3. Recommendations and next steps

Under the understanding that a short list of recommended indicators would facilitate their implementation by Member Countries, and that also cotton production systems vary widely across regions, SEEP proposed and the ICAC Secretariat agreed to conduct a survey among participants to the Plenary Meeting and Coordinating Agencies asking for example which are the most relevant indicators among the list of 64 recommended indicators for their specific country/region/sector, what data do they currently collect that fist with the list of recommended indicators etc.. The survey will be designed and implemented after the Plenary Meeting by the ICAC Secretariat in coordination with SEEP. The Secretariat will compile the data and produce a final report to be presented to SEEP.

The following list of questions to be discussed during the World Café was agreed upon:
Round 1:

1. What measure should be taken to implement the guidance framework?
2. Who shall be doing what in the collection of the data?
3. What might be the role of the different value chain actors?

The expected output from Round 1 is a written report with:

- The suggested measures for implementation
- Roles of different value chain actors with regard to data collection.
- A list of controversial issues and discussion points.

Round 2:

1. Are there any indicators on the list that you believe should not be there? Why not?
2. Are there any indicators you believe are missing and why are they important?

The expected output from Round 2 is a written report with:

- A list of indicators that should not be on the list and the rationale for exclusion
- A list of suggested indicators that are missing, and the rationale for inclusion
- A list of controversial issues and discussion point

4. Zambia pesticide data

It was agreed that the data from Zambia should be included in the Report on Pesticide Use

5. Water management in India

Mr. Mishra briefly explained that water management in India is becoming a focal point of the cotton industry, and submitted a report on the topic for consideration by SEEP Members. The Chair thanked Mr Mishra for the document, and Mr. Mishra authorized SEEP to publish the report online. The report is attached.

End of notes

WATER MANAGEMENT IN INDIA

- Water, Soil and Climate are three basic resources for determining nature of crops to grow in a particular region.
- An efficient utilization of above resources is essential for optimum production of:
  - Food and fibre for human life,
  - Cattle feed and
  - Raw materials for industry.
- Under a given set of environmental conditions, the production of crops is dependent on availability of nutrients and water.
- Sectoral water demand situation:

Sector	Demand Drivers
Domestic	•Population growth •Increased per capita water consumption
Industry	•Expansion of the water intensive industries like power, iron & steel, chemical is leading to increase in water demand
Agriculture	•Domestic food grain demand increasing with increase in population •Demand for Water intensive crops like wheat, rice etc. are increasing substantially •Poor water Management

- **Sources of water:**

  There are three sources of water in India:

  A. Canal or surface water.
  B. Ground water-dug wells and bore wells.
  C. Check Dams.

- India is the second most thickly populated country in the world with over 1.2 billion people. Water in India is intricately intertwined with the cultural fabric of the country, and has both economic and social connotations.
- Official estimates of the Ministry of Water Resources have put total utilisable water at 1,123 billion cubic metres (BCM) as against the current use of 634 BCM, reflecting a surplus scenario.
- Out of total availability of approximate 1.4 billion cubic km on the earth, India's per capita availability of water has been pegged at around 1,545 cubic metres a year, including non-personal consumption, such as irrigation while World per Capita water consumption is around 7800 Cubic Meters.
- Water is one of the most important inputs essential for the production of crops. Water affects the performance of crops not only directly but also indirectly by influencing the availability of other nutrients, the timing of cultural operations, etc.

Water Management Policy of Government of India:

- To minimise the negative impacts of the overuse and misuse of water and to ensure that our precious water resources are used optimally in removing poverty and achieving economic and human development, the Government of India adopted National Water Policy.
- The Government of India updates its national water policy on yearly basis which recognises and adequately addresses the challenges we face and are going to face in future.
- The objective of the National Water Policy is to take cognizance of the existing situation, to propose a framework for creation of a system of laws and institutions and for a plan of action with a unified national perspective.
- The Government of India prepare plan of action based on the National Water Policy as approved by the National Water Resources Council to regularly monitor its implementation.
- The State Water Policies are revised in accordance with National Water Policy keeping in mind the basic concerns and principles as also a unified national perspective.

GOVERNMENTAL EFFORTS FOR WATER MANAGEMENT IN THREE MAJOR COTTON GROWING STATES VIZ, ANDHRA PRADESH, MAHARASHTRA AND GUJARAT:

ANDHRA PRADESH

Surface Water**:**

- Andhra Pradesh is a riverine state with 40 rivers including 12 major (viz, Godavari, Krishna, Pennar etc) and 28 medium & minor rivers.
- The dependable yield from all these rivers is 2769 TMC (i.e.1480 TMC from Godavari, 811 TMC from Krishna, 99 TMC from Pennar and the rest from the other small rivers.)
- Water utilization so far is only 1933 Thousand Million Cubic Feet (TMC) irrigating 61.66 lakh hactares against cultivable area of 157.78 lakh hactares.
- All the rivers are seasonal, with bulk of the flow taking place during the monsoon.
- Andhra Pradesh share of dependable flow (75 % dependability) from the river system is estimated at 7.78 Million Hectares Meters (mham), out of which about 4.96 mham is being currently utilized.

- It is estimated that all these rivers together annually carry 77.75 Billion Cubic Meters (BCM) of water into the state with 75% of dependability with the present utilization level of 49.63 BCM.
- In Andhra Pradesh, total culturable command area has been estimated as 11.76 million hactares.
- The potential utilized under surface irrigation is about 5 million hectares through 17 existing major irrigation projects and 86 medium irrigation projects and while about 88 million hectares is irrigated by more than 75000 minor irrigation tanks.

Ground Water:

- The Central Ground Water Board (CGWB) has estimated that AP has about 32.95 BCM of replenishable groundwater.
- The stage of groundwater development or utilization is around 45% of the available resources of 32.95 BCM where the utilized groundwater is about 14.88 BCM leaving utilizable balance of 18 BCM *(about 55 % of the total available quantity)*.
- Traditionally, dug wells and irrigation tanks served to meet demands of agriculture in the state. However, with the advent of bore-well drilling technology, the scenario changed, especially in hard-rocks that occupy 85% of the state.
- This contributed directly to rapid development of groundwater and proliferation of wells and finally to over-exploitation of groundwater.
- Well density increased by a magnitude of over 16 folds in 3 decades or so while gross cropped area underground water increased by just over 2.5 times.
- There are 198 mandals in the state where more than 50% of irrigation is through groundwater. This is because groundwater based irrigation is the primary option available to farmers in the non command areas, facilitated by availability of easy credit for private investment.
- Groundwater assessment units in the state are categorised or listed as over-exploited in 132, critical in 89 semi-critical in 175 and safe in 833 groundwater units. Translated in terms of mandals, it is that 219 of them are over-exploited, 77 are critical, 179 are semi-critical and the rest 760 are safe
- The area irrigated through ground water is about 2.9 million hectares against the potential of about 3.9 million hactres.
- The Government has enacted the A.P. Water, Land and Tree Act with an objective to regulate usage of groundwater, whose implementation needs to be properly monitored.
- The Government has also started interventions like recharge measures, control measures, regulation in ground water management, community based management practices like improved water use efficiency, water audits, improved agronomic practices, conjunctive use of surface and ground water, revival and

restoration of minor irrigation tanks and other aquifer stabilization and protection measures, periodic and reliable data flow in terms of quality and quantity at various levels and analyses and preparation of perspective and periodic plans for a sustainable and long term utilization of ground water in the state.

MAHARASHTRA

- Water Sector Reforms aiming at empowering the people at large to involve in the decision making process.

- The state water policy ensures sustainable development and optimal use and management of the State's Water Resources to provide the greatest economic and social benefit for the people of the State.

- Government of Maharashtra, Irrigation Department encourages the formation of Water User's Association (WUAs) on the irrigation projects in the state. Directorate of Irrigation Research & Development (DIRD), Pune, monitors the following activities of formation of WUA's in the state.
    - Compilation of four monthly statistical report of WUA's in the State.
    - Compilation of quarterly report of under construction projects.

- Based on various assessments studies the 75% dependable yield is 131562 Mm^3. The permissible use of water for the State is 125936 Mm^3.

- Irrigation Projects: Irrigation projects are classified as Minor (i.e.100 to 2000 ha), Medium (i.e. 2001 to 10000 ha) and Major Irrigation (Above 10000 ha) projects based on cultivable command area of the project.

- Dams in Maharashtra:

Category	Number	Capacity of Dams
Category I (Large Dams)	200 Dams	Height: more than 30 meters, Gross storage capacity: above 60 Million cum Spillway capacity: above 3 thousand cumecs.
Category II (Large Dams)	911 Dams	Height: between 15 Mts. to 30 Mts Gross storage capacity: 15 Million cum to 60 Million cum Spillway capacity: between 2000 to 3000 cumecs (M3/sec)
Category III (Small Dams)	628 Dams	Height: between 10 to 15 Mts Gross storage capacity: 1 Mcum to 15 Mcum Spillway capacity: between 2000 to 3000 cumecs (M3/sec)
Total:	1739 Dams	

- In order to accelerate the completion of irrigation projects in Maharashtra State, Government has established five Irrigation Development Corporations as:

    1) Maharashtra Krisna Valley Development Corporation

2) Godavari Marathwada Irrigation Development Corporation
3) Vidarbha Irrigation Development Corporation
4) Tapi Irrigation Development Corporation

GUJARAT

Ground Water:
Government has carried out:

- Study to increase Ground Water Resources through Artificial Recharge.
- Micro level geo-hydrological investigation for each town considering village as a unit.
- Town-wise geophysical investigations in hard rock formations to locate feasible sites for groundwater explorations.
- Detailed geophysical and geo-hydrological investigations along coastal areas of Saurashtra and Kutch to study and suggest remedial measures to check salinity ingress in groundwater.
- Groundwater recharge works in upstream of checkdam on river Saraswati near Siddhpur as well as various types of recharge works in Kapadvanj and Bayad town.
- Groundwater study in command area of Sardar Sarovar Projects. Installed 1650 no.of piezo meters in 26 districts for observation and monitoring of groundwater level and its quality.

Irrigation:

- Water Resources Department has entrusted the work of Lift Irrigation Schemes based on river, small/big reservoirs of dam/ check dam to Gujarat Water Resource Development Corporation.
- For proper functioning of Lift Irrigation schemes and to achieve desired goals, Non Government Organization (NGOs) registered by Government are involved in the scheme starting from survey to design, estimation, construction, forming co-operative societies of beneficiaries, operation.
- Created irrigation potential in 17288 Hactares land of tribal area and 5420 Hactares land in non tribal area by completing 201 Lift Irrigation. 247 schemes covering area of 14993 Hactares are in progress.
- Carried out 130 nos. of Lift Irrigation Schemes under tribal area sub plan grant.
- Introduced the policy of pressurized irrigation system in total 19 districts, particularly Gandhinagar, Mehsana, Patan, Banaskantha, Sabarkantha etc.

POLICIES TO ASSESS WATER QUALITY IN INDIA

- The National Environment Policy took note of the deteriorating water quality of both surface and ground water.

- The National Environment Policy recommends actions such as, taking up R&D schemes for developing cost effective techniques for removal of arsenic, fluoride and other toxic substances, identification of sites for dumping toxic waste material to prevent its movement to the ground water, encourage use of fertilizers, pesticides and insecticides in a manner which presents deterioration of water quality.

- Central Water Commission is monitoring water quality at 371 key locations covering all the major river basins of India. CWC is maintaining a three tier Laboratory system for analysis of the parameters.

- The Level-I Laboratories are located at 258 field water quality monitoring stations on various rivers of India where physical parameters such as temperature, colour, odour, specific conductivity, total dissolved solids, pH and one Dissolved Oxygen of river water are observed.

- There are 24 Level-II Laboratories located at selected Division Offices to analyse 25 nos. physico- chemical characteristics and bacteriological parameters of river water. Four (04) Level-III / II+ Laboratories are functioning at Varanasi, Delhi, Hyderabad and Coimbatore where 41 parameters including heavy metals/ toxic parameters and pesticides are being analysed.

Guidelines for Evaluation of Quality of Irrigation Water

Water class	**Sodium (Na) %**	**Electrical Conductivity µmhos/cm at 25˚C**	**Alkalinity hazards**	
			SAR	**RSC (meq/l)**
Excellent	<20	<250	<10	<1.25
Good	20-40	250-750	10-18	1.25-2.0
Medium	40-60	750-2250	18-26	2.0-2.5
Bad	60-80	2250-4000	>26	2.5-3.0
Very bad	>80	>4000	>26	>3.0

WATER REQUIREMENT FOR COTTON CROP IN INDIA

❖ Cotton is cultivated primarily as a kharif crop on an area of 11.8 million hectares of which only 25% is irrigated. Major cotton growing states are Maharashtra, Gujarat,

Karnataka, Punjab, Madhya Pradesh, Andhra Pradesh, Rajasthan, Haryana and Tamil Nadu.

- The crop is sown in the hot months of April and May and is harvested during October to November in north-west and mid- west States and December to January in southern states. It requires more frequent irrigation in the southern states where the weather is warm and long season varieties are grown.
- In the North-west. cotton generally needs 2 to 5 irrigations depending upon the soil type and amount and distribution of seasonal rains. In drier and ill-distributed rainfall conditions, the crop needs 6 to 8 irrigations with 50 to 75% soil moisture depletion.
- Delayed irrigation prevents the plants from making excessive vegetative growth.
- The first irrigation should be given 40-45 days after sowing and subsequent irrigations should be light and be given at an interval of two to three weeks.
- The crop should not be allowed to suffer from water stress during flowering and fruiting period; otherwise excessive shedding of flower buds and young bolls may occur resulting in the loss of yield.
- Cotton during its early growth is very sensitive to water stagnation for long periods. Therefore, proper drainage should be done.
- Since crops require irrigation at different growth stages, the scheduling of irrigation should be planned very systematically.
- In the early stages, crops require usually lesser amount of water and any excess water applied is either wasted or propagated through more vegetative growth instead of deeper root penetration.

CCI EFFORTS FOR WATER MANAGEMENT

For 2013-14, CCI has targeted to undertake Rain Water Harvesting Projects under CSR programme in Vidarbha region of Maharashtra. Basic survey has already been completed and after survey, it has been decided to go for construction of cemented dams usually appropriate for rain water harvesting projects. Major benefits of rainwater harvesting are as follows:

- Improves quality of groundwater through the dilution of fluoride, nitrate & salinity.
- Prevents soil erosion and flooding.
- Makes use of a natural resource and reduces flooding, storm water runoff, erosion, and contamination of surface water with pesticides, sediment, metals, & fertilizers.
- Excellent source of water for landscape irrigation with no chemicals such as fluoride and chlorine and any dissolved salts and minerals from the soil.
- No filtration system required for landscape irrigation.

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