

During the 2004 World Water Week in Stockholm, the 2004 SIWI Seminar, “Balancing Food and Environmental Security: Finding Opportunities for Improving Livelihoods,” was co-convened with the Comprehensive Assessment of Water Management in Agriculture.

Overall, the presentations and discussions made absolutely clear that water is the key to hunger and poverty alleviation, since agriculture is the cornerstone for development of poor rural areas. Rural poverty eradication is closely linked to small-holder farming by the farmer’s need of growing their own food. Resource poor farmers need a new deal.

Huge amounts of water needed to eradicate hunger

Huge amounts of water will have to be appropriated to food production to eradicate undernutrition and feed the expanding world population. A crucial question is: from where will it come?

First of all, diets are important, in particular the meat component, both in terms of its importance as protein source, for cattle-based income raising, and as the response to lifestyle drivers.

Second, much of the evaporative losses in both irrigated and rain fed agriculture may be gained back, increasing the water productivity – a method spoken of as vapour shift in the sense that non-productive evaporation is being transformed into productive transpiration by soil conservation measures and protection of the plants from dry spell damage.

Third, by increased irrigation, but this will involve appropriation of even more blue water for crop production. Since the result will be further river depletion, it will have to be limited by what the aquatic ecosystems can endure in terms of reduced stream flow, defined as environmental flow. In some basins with severe silt problems there is also a need for stream flow enough to flush silts to avoid unwanted sedimentation.

The concept of environmental flow still remains rather unclear, however. It lacks an agreed definition, and is to a certain degree seen as an issue of value judgement. Although water quality is getting more and more important as urbanisation expands, it is not yet incorporated in environmental flow criteria.

Land productivity degradation is a severe complication

Land productivity continues to degrade on a large scale. The worst degradation of productivity originates from incautious land and water management and land use

change. A large number of “bright spots” studied by the International Water Management Institute (IWMI) are, however, cause for optimism, suggesting that this development can be stopped or even reversed. A key activity will be supplementary irrigation to compensate the effects on land and water productivity. A 25-year study in India showed that by land and water management, it was possible to achieve the yield potential. Downstream effects of increased upstream supplementary irrigation will have to be clarified.

Balancing against resilience constraints

How far it will be feasible to reduce river flow and expand into virgin terrestrial ecosystems will basically be an issue of resilience. Interesting differences were highlighted between Africa and South Asia. In Africa, earlier clearing should already have reduced the green water flow and therefore also water-related functions of terrestrial ecosystems. This reduction might in fact be restored by upgrading rain fed agriculture

ability, and green for focus on all green water flows – productive as well as non-productive – for improved food production with a particular effort to increase water productivity.

The potential components of such efforts are already in view: there is in fact a huge potential and at least six possible pathways available, focusing on respectively diets, food trade, alternative water sources, irrigation efficiency, recoverable evaporation losses (crop per drop of green water flow), and better land and water management.

There is also a time perspective involved which is essential for the hunger and poverty alleviation efforts. We do not have 100 years of leeway. Development has to be seen as stepwise approach, with a transition time that will depend on the farmer’s situation, and where irrigation as opposed to rain fed agriculture are related to capital costs as compared to failure risk. The virtual water potential is linked to the rate of adaption of the trade system as well as possible agricultural development in exporting regions. Also the negotiation-based trade



Photo: Mats Lannerstad

in order to once again increase the green water flow. In South Asia, on the other hand, earlier irrigation has reduced the blue water flow, closing basins to a degree where environmental flow criteria will set the limit for proceeding.

Australia was referred to as an example where environmental flow had been exceeded and must now be restored by returning allocated water from irrigating farmers. Negotiations are necessary for that purpose. It was stressed that for successful trade-off striking, a legalised agreement is essential in order to authorise the balancing negotiations.

The triple green revolution

What is needed now is a green-green-green revolution: green for rapid production increase, green for environmental sustain-

off striking in closing river basins between environmental flow requirements and water needs for increased crop production are time consuming.

As a final conclusion, it will be essential to develop effective methods for negotiations between competing water needs. Also the poor will have to be given a voice in these negotiations. In order to orchestrate a catchment or basin towards compatibility between competing water interests, the Integrated Water Resources Management process will have to be further developed so as to clearly incorporate also both land use and ecosystem resilience, and both needs for further water resources development, and needs for reallocation of water already in use.