

# Food Security and Biodiversity

by A Z M Obaidullah Khan

History tells us that cycles of plenty and shortages will continue. But for Asia, the fastest growing region in the world, these fluctuations could amplify owing to shrinking farmland, worsening land degradation and scarcity of water.

"**G**IVE us this day our daily bread; and forgive us our trespasses", the Christian prayer says (Matthew 6:11 ff.) a poem echoing down the ages in humanity's discourse with the Creator. Sages in ancient India chanted a hymn from the holy text of the *Upanishads*. "From food are born all creatures that inhabit the earth. Afterwards, they live on food. And when they die they return to food." Gautam Buddha cries out deep compassion. "Of all diseases, hunger is the greatest... There is no other treasure equal to that of rice..." (Khu. Dha. 25/42; Sam. Sa 15/9; Sam. Sa 15/44) Jesus Christ bows down in thanksgiving. "I was hungry. You gave me to eat." And the Holy Quran reveals: "Then let man look at his food and how we provide it: for that, We pour forth water in abundance, and we split the earth in fragments and produce therein corn and grapes and nutritious plants, and olives and dates, and enclosed gardens, dense with lofty trees and food and fodder — for use and convenience to you and your cattle..." (Abasa 24/32)

Inspite of the God-given bounty, searing image of degrading hunger and exhausted earth continues to haunt us. Poet Archibald McLeish once said, "We have learned the answers, all the answers, it is the questions that we don't know". People with broken ploughs ask us the questions, so does the thirsty land and desolate sky. I hope scientists and policy-makers will provide the answers.

I propose to share some thoughts about "food security and biodiversity". I shall begin with the aggregate availability of food within and across countries and the scenario today. Because, what Susan George said in 1976 still remains valid: "If you want to eat, you must be able to grow your own food or to buy it or a combination of both." (How the Other Half Dies : The Real Reasons for World Hunger.

1976), I shall then try to delineate briefly the linkage between environment and food for the food-insecure particularly in difficult times and stressed circumstances. Rural societies maintain biodiversity because it is essential to their survival. They breed improved varieties through natural selection for livelihood-security. An underlying hard political issue there is the control of and access to natural resources including land by those who are dependent on those resources.

A corollary to the customary rights of the peasantry is the right to their own knowledge system. Collective knowledge of the producers is excluded from the definitions of intellectual property rights. Social creativity of generations of women and men farmers or the upland community, is dismissed as folklore. That is the third issue I am going to write about namely the enclosure of "intellectual commons" of the peasantry and the indigenous people. (Vandana Shiva, 1995).

The preceding three decades and a half have seen substantial advance in efforts to produce food. The volume of agricultural production doubled over that period. But problems were emerging just beyond the horizon. Output from the world's once-resilient ecosystems, started to falter in the early 1990s. Downward shift in cereals production was matched by slippages in fisheries and livestock, ratcheting the pressure on shrinking croplands.

Cereal harvests shrunk for the third time in 1995. Global grain reserves were at their lowest in over two decades. Stocks in the granaries dwindled to about 14 per cent of trend use much below the 18 per cent food security benchmark. Stocks of cereals in Asia in 1994-95 is 8 per cent less than the peak of 133 million. Two years ago.

The latest evaluation of FAO statistics: "Early indications point to a recovery in (cereal) output

this year... (But) food security in the coming 1996-97 season depends crucially on a good 1996 cereal crop." As the scepter of the "dust bowl", of the thirties hangs over the drought-stricken farmers in Kansas, Oklahoma, Texas and Colorado, the promise of the nation's smile is fading fast in North America.

The year 1995 saw the steepest rise in the price of rice, corn and wheat. Nations paid more to buy foodgrains than any other time since the 1970s. Governments of food-deficit countries in Asia and even an emerging tiger like Indonesia and the once self-sufficient Philippines were dunned with exceptionally high bills for food-imports. Plateauing yields and price inflation combined to slice food aid to half in three short years, from 15.2 million tons in 1993 to 7.6 million tons in 1996. Let us also not forget the lessons from the food crisis in 1972-73. Surplus stocks of major producing countries which could have ensured the survival of all humanity melted like snow in the sun without the hungry being able to glean anything but the crumbs.

Today, for example, there are worrying signs of restrictions by the European Union on grains-export due to production shortfall. As I have already mentioned, in North

of plenty and shortages that I have just outlined, will continue. But for Asia, the fastest growing region in the world, these fluctuations could amplify owing to shrinking farmland, worsening land degradation and scarcity of water.

Arable lands are at their thinnest slivers in Asia. In just twenty years, the balance of the limited uncropped land will be halved in South Asia. East Asia's will be sliced by a third. Roads, factories, shopping malls and resorts bury under concrete prime farm land. Many aquifers have been pumped into salt-contaminated jugs. Water supplies today have slipped into a third of what they were in the 1950s. Asia already uses half the world's water. By the year 2000, Asians will use 60 out of every 100 gallons. Most will be groundwater although aquifer withdrawals will exceed recharge in many areas. Crippling water shortages have appeared in North China, West and South India. Overuse of ground water is a policy issue in the Philippines and Thailand.

Beside, wind and water-erosion and other forms of land degradation strip farms in Asia of vital and fragile top-soil. Eight countries of South Asia lose more than US \$ 10 billion each year due to land degradation. Already an estimated 43

per cent of agricultural land in South Asia are blighted. Water erosion had affected 34 per cent of 45 million cultivated hectares in China. The same has degraded 43 million hectares in Indonesia and 13.6 million in the Philippines. Soil fertility decline has occurred in over 3.2 million hectares in Vietnam. Salinization is affecting another 3 million hectares in Thailand. In Mongolia, over 35 to 50 top-soil have been lost from each hectare of plowed land over the last 30 years due to wind erosion.

The issues that I have outlined above are succinctly put by Dr Peter Kenmore, "The degradation of the paddy environment, whether by micronutrient depletion, atmospheric pollution, pest pressure or toxic change in soil chemistry is greater than the capacity of genetic improvements in yield-potentials that breeders can select."

If a homogenized environment and monoculture uniformly imposed from the top makes the chemical agricultural oppressive, an ecological approach perhaps could be more pluralistic and less anthropocentric. "If food systems are seen as a chain, with inputs (seed, fertilizer, machinery, etc.) at the one end, farmers in the middle, and the post harvest activities at the other end; then it is clear now that industry owns both ends of the chain. The farmer, the man or woman in the middle, has less to say about agricultural policy than ever before and the smaller the farmer, the less he — and especially she — has to say." (Susanne George, 1996). It can be argued that commodity production with externally driven technology and inputs alone,

can marginalize local knowledge system and impoverish both genetic diversity and the livelihood security of peasant communities.

In fact, plant genetic diversity is an important line of defense against catastrophic loss for the small farmers. Peasant gardens of traditional agriculture are less vulnerable to disastrous crop-failures, because they contain a wide variety of plants including land-races grown from seed selected over generations for the desired fit with production niches. That indigenous people inhabit the most diverse fields and forests is sometimes viewed as both coincidental and unfortunate. That a correlation exists between the uses made by rural communities of biological diversity and the sustenance they draw from that diversity is seldom considered.

Conservation farmers in Northeastern Thailand, for example, derive a significant proportion of their diet from natural food. Khon Kaen University nutritionist Prapinora Somansang has recorded that in rainfed areas of North East Thailand, villagers gather or hunt more than 100 types of natural food from their environment. Research undertaken in 82 villages in semi-arid areas in India (Jodha, 1990) revealed that the poor obtain approximately 15 to 25 per cent of their household income from common property resources which, in addition, provide them with one-third of their farm-inputs. Jodha noted a decline in the geographical area covering Common Property Resources ranging from 26 to 63 per cent over a twenty-year period. If access to environmental resources

South India is becoming a self-laden graveyard. Displaced from the sea and from the farm, the local communities are stalked by hunger.

An important dimension, therefore, for food security and biodiversity is the resurrection of local knowledge and coalescing it with science and technology for creating common wisdom. For that, the experts have to join the farmers as they seek to understand natural variations. The knowledgeable outsiders will and should bring their conceptual wisdom and concomitant innovations to discuss, debate test or reject with the women and men farmers in locally specific ecologies. Instead of asking, "will this fit?", let the national and international scientists and innovators ask a more frightening question, "will this innovation make it worse?" Hippocrates begins, "First, do not harm."

That brings me to a related argument and that is the distinctive knowledge of women as far as food-security and biodiversity are concerned. As Rochleau puts it, "half or more of indigenous ecological science has been obscured by the prevailing invisibility of women, their work, their interests and especially their knowledge." (Gender, Ecology and the Science of Survival: Stories and Lessons from Kenya by D.E. Rochleau in Agriculture and Human Values, 1991) Women in many parts of the world, particularly in Asia and Africa have continued to play and still play a key role in preserving diversity, and in subsistence food-production. Kayapo women in Brazilian Amazon, for example, not only breed new crop varieties but preserve representative sam-



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Quickly shall that grow again.  
May that O pure one,  
Pierce thy vital spot or thy heart.

of such rights needs to be clearly spelled out. Let us not dare forget that women farmers in Asia hold up more than half the sky.

However that may be, if we accept women and men farmers as germplasm collectors and rightful owners of their own experimentations and seed collection, there is a strong case why the control of biodiversity in general and plant genetic diversity in particular should be brought to the local communities. Broadening the circle of social control, and I am plagiarizing from Michel Pimbert, of how genetic resources are managed and utilized is central to tomorrow's food security.

Community-level plant genetic resources conservation is most viable, because it helps ensure that resources are managed in living conditions in the different ecosystems and socio-cultural conditions of the farmer custodians. Contextualized in the local ecosystem, community conservation facilitates continuous adaptation to changes, to both biotic and abiotic stresses, and most importantly, to farmer selection. The creator, custodian and end user of PGR is one. It was the farmers, of past and present generations, who provided the PGR diversity that we have today. Conservation of PGR cannot be divorced from its utilization, and therefore, cannot be divorced from its end users — the farmers.

For the best use to be made of Plant Genetic Resources farmers must control their own bio-materials and have access to as wide a gene pool as possible. They must be able to incorporate knowledge and information about their material when it is available elsewhere. Farmers' rights, in relation to the accessions conserved in national and international gene banks, need to be ensured. It is unfortunate that while the convention on Biological Diversity focuses primarily on naturally occurring species, status of collection prior to the convention vis-a-vis intellectual property rights still remain in limbo.

Sustainable enhancement of

biological diversity for food-security will require the formation of a new covenant under which farmers and scientists; non-government and people's organisations, governments and international institutions, can work together for the well-being of humanity. Such lofty words cannot mask the fundamental power imbalances among the actors. Hence, the necessity of ensuring mutual respect and mutual benefit. The traditional/modern or common/private dichotomy usually short-changes the powerless at the market place of the powerful.

I am afraid, I have raised more questions than answers. Sustainable food-security that builds on biodiversity is more of a process for learning in locally specific cultural matrices and ecosystems and much less on a neat and universal model. The process began when "men discerned the sun's compassion on the seeds he sowed in the earth" and it continues.

A Vedic hymn to the earth, Prithi Suktika chants:

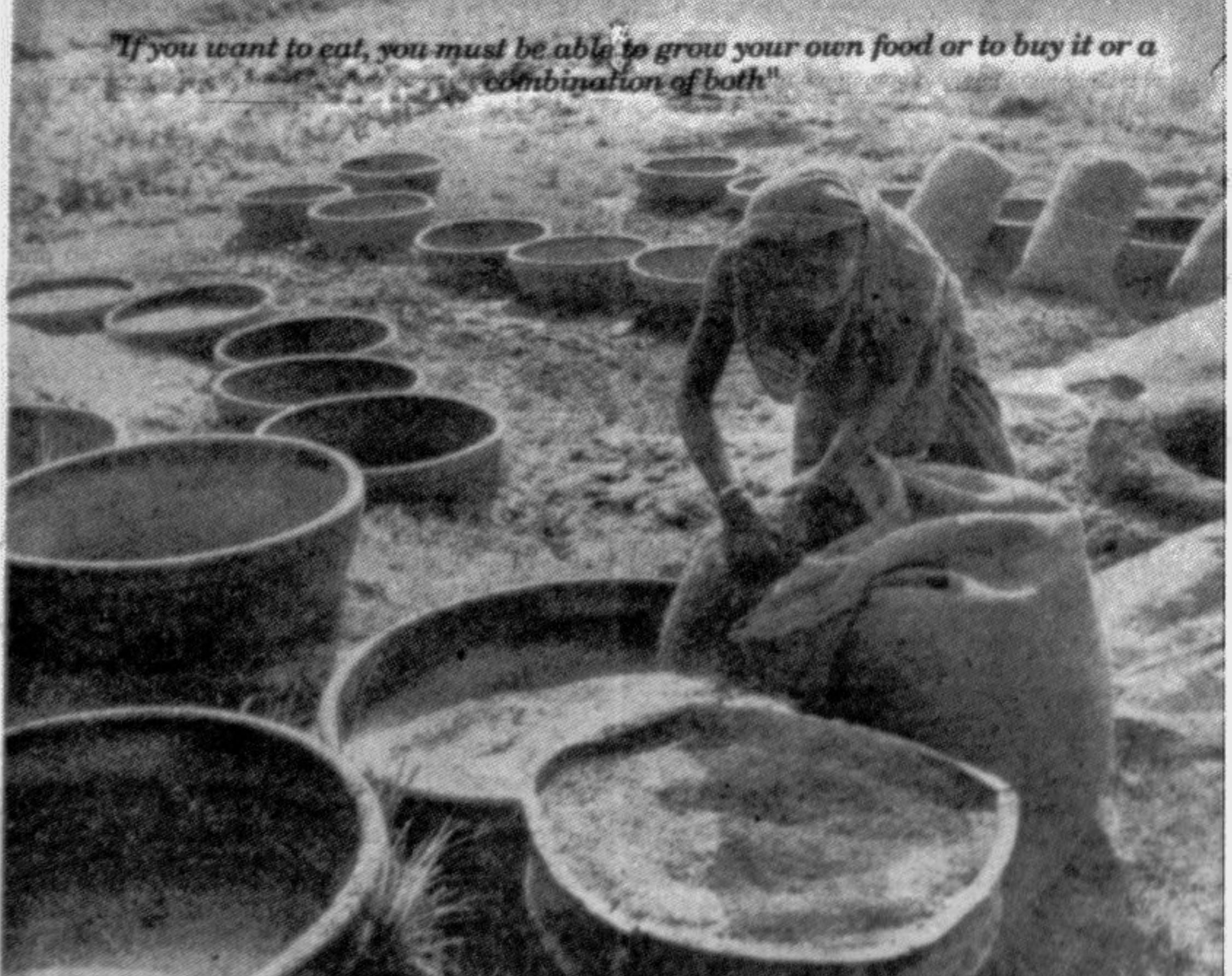
"What O Earth, I dig out of thee,  
Quickly shall that grow again.

May I not O pure one,  
Pierce thy vital spot or thy heart."

Degradation through hunger and desiccation of biological diversity are the most extreme forms of piercing the heart of nature. What is "natural" is never merely so; it is a tryst with divine mercy for ensuring the right of each individual human being to food. In a fragile biosphere, the ultimate fate of humanity may depend on cultivating deeper sources of human fulfillment rather than indulging in sheer greed. The apparent dualism between the body and the spirit is overcome by the humanity's trusting relationship with the natural world. The Bible echoes human wisdom when it asks, "What shall it profit a man if he shall gain the whole world and lose his soul?"

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## The Daily Star Entertainment Guide

Thursday 1st August  
(All programmes are in local time. We recommend programmes printed in bold. There may be changes in the programmes)

BTV

3:00 Opening Announcement All

Quran Programme Summary 3:10

Recitation of the Gita 3:15

Retelecast of selected programme from TV Archive 4:00 News in Bangla 4:15 Khetar Jagor 4:45

Cartoon Film: Tom And Jerry 5:00

News in Bangla 5:25 National

Television School Debate 6:00

News in Bangla 6:30 Esho Para

Shikhi: Mass Education 7:00 The

News: 7:05 Jiboner Alo 7:25

Nazrul Songs 8:00 News in Bangla

8:40 E-Shapthar Note 10:00

News in English 10:25

Jannabuddhi 10:35 Film Show:

The Equalizer 11:30 News in Bangla 11:35 Friday's programme 11:40 Close down

BBC

6:00am BBC Newsroom inc.

World Business Report/Asia

Today/24 Hours 9:00 BBC World

Headlines 9:05 BBC Global Report

10:00 BBC Newsday inc. World

Olympic Report 1:00 BBC World

Headlines 1:05 Madness 2:00

BBC World News 2:30 Time Out:

Lisa Clayton: Alone Around The

World 3:00 BBC World News 3:30

Time Out: Top Gear 4:00 BBC

Newsdesk 6:00 BBC World

Headlines 6:05 BBC World

7:15 BBC World Business

Report 7:30 BBC NewsHour Asia

and Pacific (inc. world Olympic

Report) 8:30 Time Out: Raymond's Blanc Manga 9:00

BBC World Headlines 9:05 BBC

Global Report 10:00 BBC World

News 10:30 Time Out: The

Contenders 11:00 The World

CHANNEL V

7:00am Rendell VJ Sophie 8:00

Jump Start VJ Sophie 8:00 Frame by

Frame 8:00moop The Vibe VJ

Luke 1:00 By Demand VJ Trey

2:00 Rewind VJ Sophie 4:00 Big

Bang VJ Alessandra 4:30 By

Demand VJ Trey 5:30 Music

Update 10:00 Rewind VJ

Sophia 8:30pm The Vibe VJ Luke

7:30 First Day First Show 8:00

Features Dragonheart 3:00 The

Oprah Winfrey Show 4:00

Videocon Flashback 9:30 Classic

Rock 10:00 Classic Rock 10:30

First Day First Show 11:00 House

of Noise VJ Luke 12:00mm The

Ride VJ Trey 1:00 Hayash 2:00 By

Demand VJ Trey 3:00 Billboard US

Countdown 5:30 Frame by Frame

STAR PLUS

6:30am Spark 7:00 Teenage

Mutant Ninja Turtles 7:30 Gi Joe

8:00 Saber Rider And The Star

Sheriff 8:30 The Adventures Of

Black Beauty 9:00 Aerobics Oz