

Feature Science and Technology

A Rare Display of Architectural Prowess

ARCHITECTURE, here in Bangladesh or in any of the developing countries for that matter) may still be in its evolutionary stage and would certainly evolve further. But architecture in developed countries has undoubtedly reached supreme standards.

While architects there, are designing with energy-conserving low emissivity curtain wall glazing or constructing buildings on the site with pre-cast concrete materials, people here are designing with basic or simple structures. To all these, that is, the East and West extremes, Tanwir Nawaz, a much celebrated Bengali architect, urbanist and human settlements consultant based in Ottawa, Canada, is a witness.

Nawaz, who after taking a first class degree (B. Arch.) from BUET in 1967, undertook graduate studies (M. Arch.) in Urban Design and Environmental Studies at Texas University, USA. In 1976 he became one of the two registered architects of Bangladesh origin in Canada and is licensed to practice architecture in Ontario, Saskatchewan and Manitoba in Canada.

Recently 'An Exhibition of Selected Architectural Works in Canada of Tanwir Nawaz' was held at La Galerie, where only a part of his total work over the past 21 years were shown.

Glockenspiel, one of his interesting architectural creations, is a clock and bell tower, donated to the city of Regina as a symbol of the city's diverse ethnic make-up. It was sponsored by the Regina Multicultural Council, an association of over 60 ethnic organisations.

The structure was designed with three slightly radiating poles mounted on a stone pedestal," says Nawaz.

Five increasingly larger rings were placed on the outside of the poles to carry the 23 chiming bells. All of this was topped with a simple illuminated clock. The tower bell also plays taped music when programmed, you can even play 'Sonar Bangla' if you want to," Nawaz explains his creative designs.

River View Heights, a six-unit semi-detached housing project is another one of his enchanting innovative designs. This project was developed as an infill on a vacant site, between built-up projects. The whole concept of this design evolved from sharing and exploiting the view of the Ottawa river, explains Nawaz excitedly.

A multilevel independent design was created, due to the narrowness of the site. At the front each pair of units, which shares a semi-detached wall or one common wall, were staggered and narrowed at the front," he continues explain-

ing. This project has a semi-circular solarium and the multilevel design permits ground access at the back and a view of the river from the living room and the bedrooms at the top. The master bed occupies the total top floor, has a walking closet, an ensuite bathroom with a whirlpool bath. This bedroom also has a high cathedral ceiling; one of Nawaz's favourite ceiling designs.

Bedford Glen Terrace Condominiums which was designed and built in the middle to late 70s in North York, Toronto is one of the most awarded and celebrated architectural projects of the 70s in Canada. The project was designed as a terraced condominium housing on a sloping site beside a natural stream.

The planning was so done as to put the natural stream into a tunnel culvert through the middle of the site. However, natural grace of the site was maintained and a combination of step-apartments and two-storied town houses and penthouse units were designed. The site was richly landscaped and a fountain was created that joins a natural stream.

Besides these, the seventh street JP School and day care centre won an award of merit in 1990 from the Association of School Buildings officials and was recently featured in an exhibition entitled 'The Best School Architecture at the AIA Headquarters' in Washington DC.

The school accommodates three principle programme components, namely, the academic tracts, general purpose room and the day-care centre. These are expressed in three building blocks in a compact composition designed to conserve energy and leave as much open space as possible for outdoor activities.

"The spacing of the blocks is punctuated by gabled roofs which mark areas of special importance," Nawaz describes his plan in details on the blue prints and snapshots pasted on boards at the gallery.

This exhibition, which was arranged by Nawaz's brother, a lawyer and musician, Tawfique, and his wife Dipu Moni Nawaz drew a large crowd mainly interested in fashionable architectures.

Nawaz has coordinated development projects involving major housing and office buildings, designed and implemented commercial, recreational health-care projects. He has been lecturing and writing regularly on emerging urban issues in developing countries, in particular, on the problems faced by mega cities.

Nawaz who is working for 21 years and is a practitioner for 15, recalls that he was with a private consulting firm here, a teacher and also was in charge

by Raffiat Binte Rashid

of the Physical Planning and Housing sector in the Planning Commission Bangladesh, around the years '67 to '73.

"I have been visiting Dhaka at regular intervals ever since I left. I have no plans to come back permanently as yet, but I might be working here on small projects," he says.

Diversity — which is his main attraction will definitely be present in the works he will do here. "Mixing the culture, the background and, of course, keeping in mind the climate, the social and economic conditions of Dhaka, I will proceed with my designing here. I will try to bring in latest technologies with which I have worked so far, but all that too must come in gradual steps, because I will have to work with many others to complete and materialise my plan besides myself," he laughs as he describes his future plans in Dhaka.

Among many of his works are Concord Corporate Centre, the structural system of this construction was through pile foundation and framed structure with flat slabs. His latest project Glenview Corporate Centre which starts in late 1994 is designed with a combination of energy-conserving low emissivity curtain wall glazing with pre-cast concrete squandrel panels.

But among all these exclusive and highly modern architectural works of Nawaz, his plan proposed for the competition for an expansion of an existing museum and the addition of an art gallery to Norman Mackenzie was undoubtedly challenging and an excellent piece as far as idea goes.

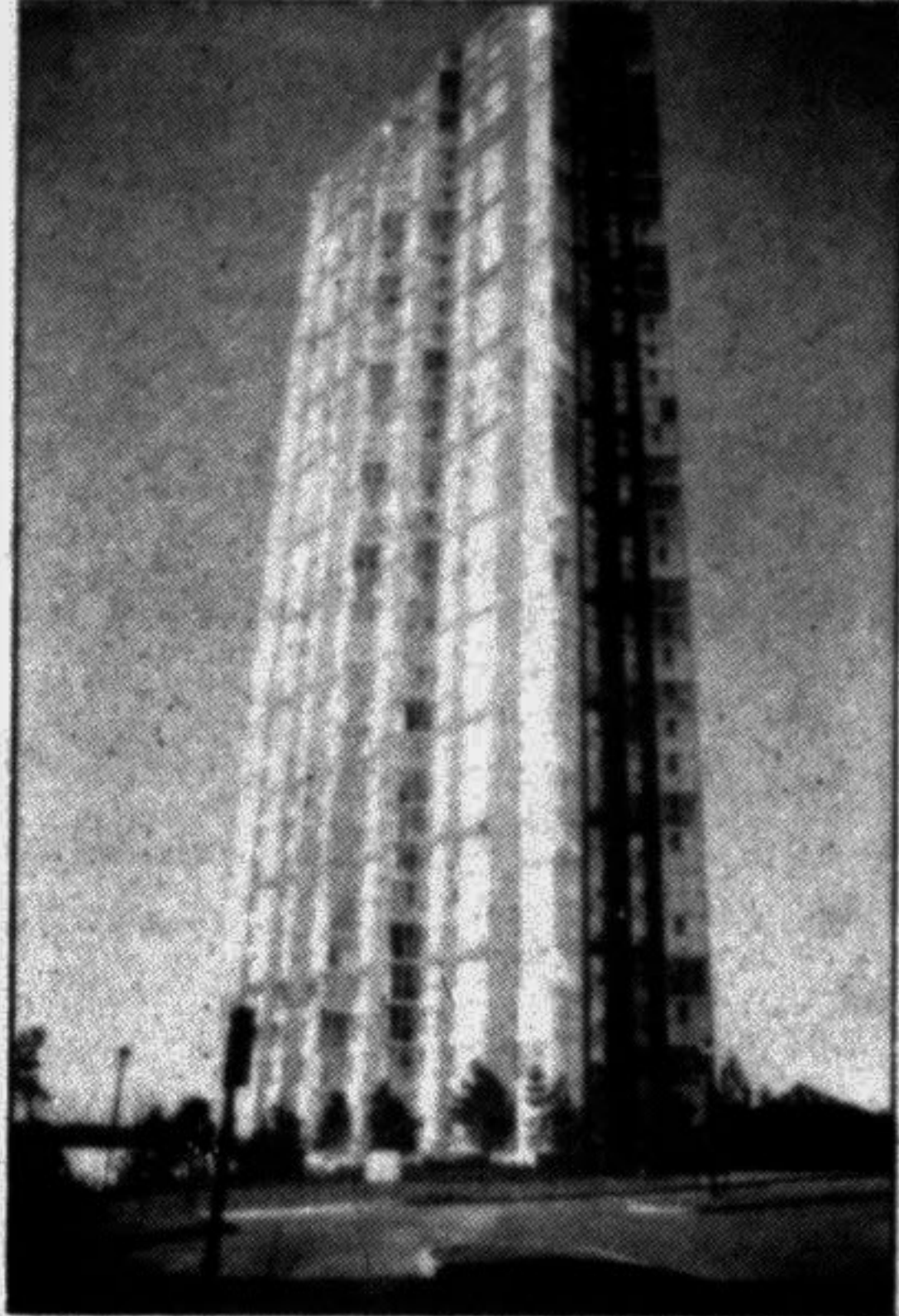
Among 24 competitors, his plan qualified within the five finalists. "The proposed design showed the project with five different display galleries, studios, and auditorium, cafeterias, major support facilities, display framing, conservation labs, outdoor display areas and administrative offices." This was fabricated elaborately by Tanwir Nawaz Architect Limited.

A handsome glazed entry was created, the gallery was designed as a spine for the gallery and the link, and outside materials were locally-mined tyndol stones with rough and sawn off surfaces added with specialised glazing and pre-finished porcelain enamel panels," explains Nawaz enthusiastically.

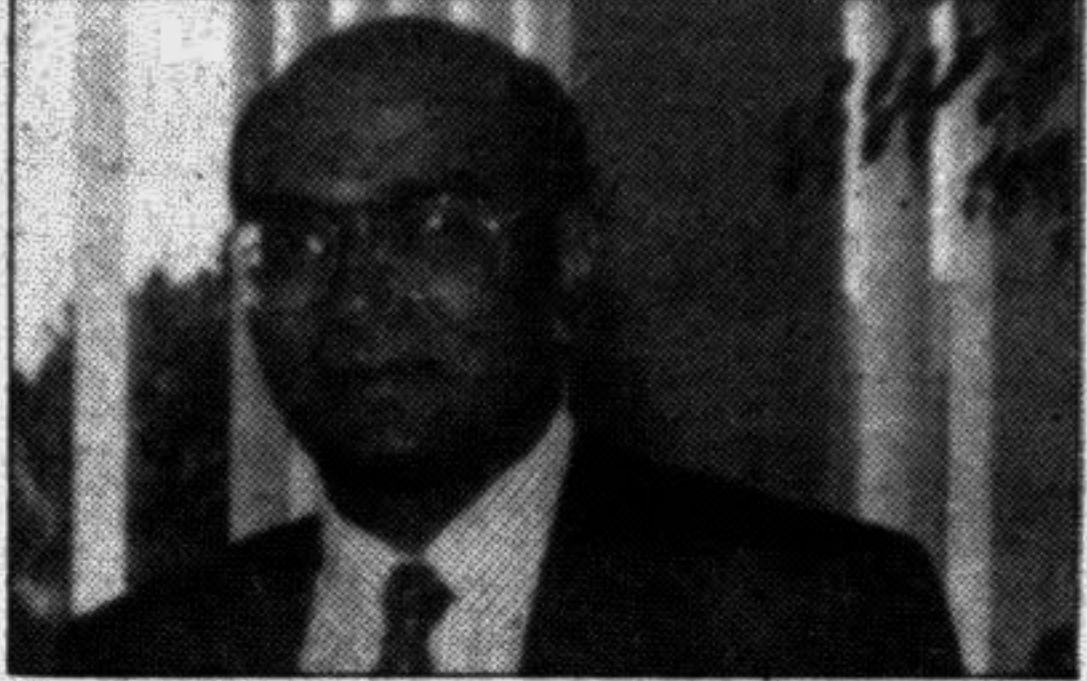
All these superb building and landmarks of Nawaz is only a token display of his real massive works. This show was his first in Bangladesh and definitely the beginning to an extremely modern, in-vogue and renovated future Dhaka.



River View Heights housing.



Concord Park Condominiums.



Tanwir Nawaz.



Bedford Glen housing.

An Inquiry Into Human Origin

by Shireen Bari

MODERN science is now at the end of the twentieth century, but still scientists do not know from where life came, or what is the Human Origin? The new changes that science is undergoing today lead to a radically new situation. The greatest successes of modern science is Molecular Biology, that play a central role in the mechanism of life.

Jacques Monod the first rate Biologist of twentieth century made some points on human origin. In his book "Chance and Necessity" he wrote that "Man knows at last that he is alone in the universes' indifferent immensity, out of which he emerged only by chance."

It is a fact that some of the greatest successes of modern science are discoveries at the microscopic level. And for that reason Molecular Biology has been immensely successful in isolating specific molecules that play a central role in the mechanism of life.

Modern Biologists have taken Darwin's theory of Natural Selection in different way. As Darwin's conception for the diversity of life on earth receive a fascinating modern interpretation in the language of atom and molecules. That is Neo-Darwinist.

Darwin's theory taught us that man is embedded in biological evolution, and Einstein has taught us that men are embedded in an evolving universe. So how man is embedded in biological evolution and how he emerged only by chance is now a hot heated debate for Biologists as well as for the Physicists.

Darwin's theory shows that life has become more organised through time, as simple creatures evolved into more complex ones. And that all contemporary species have a common ancestor dating back over a few thousands million years. And that the ultimate ancestor from which all living things are descended must have been one or a few single celled organism. In physics there is another fascinating law that is the Thermodynamic law, especially the second law of thermodynamics which means that entropy, a measure of charge, that always increase with time and the total entropy of the universe is increasing, tending towards a maximum corresponding to complete disorder of the particles in it. The major disagreement between them is one towards the complex and the other towards the elementary.

Biologists like Dawkins, Monod and others are serious with the conception that chance and the mechanical rearrangement turn a single replicators into man. And according to them the new name of this replicators is genes, and man is their survival machines. Now

the question is where than must we look for Pripoval man? Was the oldest Homo Sapiens Pliocene or Miocene, or more ancient.

In eighteen century when science was not as developed, as it is now, but still at that time some scientists tried to look behind Apes to Monkeys and, behind them to the earlier animals from which monkeys sprang. They wanted to detected out a link according to the concept that man had their origin in the shapes and behavior of such creatures. Molecular evidence clearly shows that man's closest relative are the orangutans and the chimpanzees. As a fact the basis of comparisons of the protein chains, man and chimpanzee share 99 per cent of their genetic material.

Again nothing like human intelligence appeared on earth before a few million or at least a few tens of million of years ago. Than why men appeared so late? Scientists have given, that perfect brain did not evolve until recently. And never before was there a brain with so many neural connection or synapses. Scientists. Have suggested that men and apes have evolved more slowly than the other mammals. But here we see that a gap of about 5 million years, the time of Ramapithecus 10 Myr BP. How these apes learned, among other things, to walk upright. If man is merely the result of two hundred million years of evolution than why new brain that is cerebrum developed so fast over the past half million years, hen there was no biological need for it. Science is silent here and has no answer for it. Planet earth is an extremely ancient place, long populated by many kinds of creatures, some of them are no longer living.

How the development did happen, and how the laws of evolution alone produced such an intelligent creature like man. Again if man emerged in the universe by chance and there is no higher intelligence that have directed the process by which the human race was developed, then why we see a great balance in nature. The balance exists only because the laws of physics include an "exclusion principle" which forbids two electrons to occupy the same state and if laws were changed so that electrons no longer excluded each other, none of essential chemistry would survive.

Again we see that biologists and physicists are not working in same way. For the biologists, every step down in size was step toward increasingly simple and mechanical behavior. As a bacterium is more mechanical than a frog, and a DNA molecules is more mechanical than a bacterium. But physics has shown that a reduction in size have an

opposite effect. When we divide an atom into nucleus and electrons, the electrons are less mechanical.

The problem of the origin of human remains a difficult one, and still scientists are not able to give an accurate answer in this respect. Here we can say that the brain of pre-historic and of savage man seem to be an invisible power which has guided the development of the lower animal through their ever-varying forms of being. And that one superior intelligence has guided the development of man in definite direction, for a special purpose.

Very old are we men
Our dreams are tales
Told in dim Eden (Water De La Mare)



Neanderthals man.

Biotechnology to Improve Floricultural Crops

by Dr Mokbul Hossain

FLORICULTURE, perhaps more than any other industry, must respond to frequently changing consumer demands. Changes in preferences, fashion and aesthetic appeal result in an ever increasing demand for flowers which have novel or unusual characteristics.

The introduction of new species and cultivars is, thus a major objective within the industry. Conventional breeding and selection, with mutation breeding and selection of natural mutations have been the main sources of the different array of flower cultivar currently available.

The world-wide floriculture industry was valued at about US\$4 billion in 1991 and is increasing at an estimated annual rate of 8-10 per cent. The major centres of production and consumption of flowers, are in Europe (particularly the Netherlands), the USA and Japan with significant production occurring in Kenya and Columbia.

The main species grown include carnation, chrysanthemum, rose, tulip and lily. In Asia, the countries like Malaysia, Thailand and Singapore are producing orchid and they are earning a lot of foreign exchange by exporting them to other countries.

The importance of novelty in marketing, the fact that the flowers are not used as food, and the size and value of the floricultural industry suggest that if biotechnological methods could be used it would have real economic impacts.

involved in Micropropagation. 1. induce the growth of shoots in vitro from the pre-existing meristems in the shoot tip or from axillary buds; 2. maintain and proliferate these shoots through a series of subcultures; 3. induce individual shoots to initiate adventitious roots, either in vitro or in vivo and 4. acclimatise plantlets to free-living conditions.

Micropropagation is thus similar to the traditional method of vegetative propagation using cuttings but has the distinct advantage of producing greater numbers of identical plants in a much shorter time. The culture of shoot meristem has proven particularly useful in eliminating viruses from plants. Shoot meristem culture, frequently in association with heat treatment, is now a commonly used method of eliminating viruses from plants.

Somaclonal variation: The regeneration of plants via a callus intermediary can frequently result in plants that are phenotypically and genotypically different from their progenitor. The exact mechanism which induce this phenomenon, originally termed calliational variation, now termed somaclonal variation have yet to be elucidated. It is unlikely that any reason can explain all the variations that have been observed. Whatever the causes, somaclonal variation has been extensively exploited in many species to create variants. Somaclonal variation has been studied and utilised in a number of important flower crops, including carnation, chrysanthemum, lily and pelargonium.

Embryo culture: Breeding programmes using intra or interspecific hybridisation often fail, because in some crosses

fusion of gamete does not occur. This may be due to the failure of pollen to germinate on the stigma or an arrest of pollen tube in the pistil. Moreover, in some instances, fertilisation occurs but the resulting zygote aborts due to post-zygotic failure such as lack of endosperm formation or expression of lethal recessive alleles.

In such cases, it is possible to use in vitro fertilisation or embryo rescue techniques to obtain viable embryos. Embryo culture was used to obtain interspecific hybrids of lily over 50 years ago and more recently with other members of the genus and other species, including chrysanthemum and carnation to develop new hybrid plants.

Haploid culture: The culture of anthers, ovules and individual microspore is of considerable value to breeders as it is possible to produce haploid plants which reveal recessive alleles. These haploid plants can be used for the production of inbreeding. Added benefits, such as small flowers and prolonged flowering times, might ensue from the use of haploid plants as they are usually smaller than the diploid counterparts and being sterile there will be no pollination-induced senescence. Haploid culture has been used in Pelargonium sp to eliminate virus, in Lillium sp to produce haploid plants and in some other crops to obtain different flower colours.

Genetic Engineering: For genetic engineering to be effective in delivering new plants for floricultural use, three essential and interacting components are needed: (1) a suitable regeneration system to produce transgenic plants; (2) an efficient transformation system to deliver foreign DNA to individual cells and (3) suitable

able genes that have been characterised and cloned and can impart favourable traits. The expected benefit of a genetic engineering approach to improve crop plants relies in part on the perceived precision by which traits might be modified. Unlike conventional breeding, gene transfer can supposedly maintain varietal integrity which at same time be directed at altering a single trait controlled by a specific gene. However, while there is an abundance of literature available on regeneration of floricultural crops, there is little information on transformation.

Progress with major flower crops: Carnation: There is a substantial body of work on carnation regeneration and viable success has been reported for a range of explants derived from both vegetative and reproductive tissue. Chrysanthemum: This flower crop has proven relatively flexible in its response to different regeneration techniques. Adventitious shoots have been regenerated from an assortment of explants, arising either directly from the explant surface or via callus. Calli developed from ray florets, leaves and shoot tips have all been used successfully to produce adventitious shoots.

Rose: The development of shoot promordia from stem callus was first reported for rose in 1967. However, it is only in recent years that this preliminary works have been revitalised, although with limited success. Recently reported regeneration systems have utilised a number of different techniques and explant sources. Gerbera: Gerbera has a rosette habit, and the traditional method of vegetative propagation, by dividing up the crown, has proved too slow to be commercially viable.

To overcome this, micropropagation methods have been developed for the commercial production of this species. In the Netherlands alone, an estimated 16 million plants were produced by tissue culture micropropagation in 1988.

Save the Whale — and the Goat, Chicken and Buffalo

by Peyton Johnson

THEY are the most workmanlike and least glamorous members of the animal kingdom. And they are fighting for survival.

Of the world's 2,719 registered breeds of cattle, buffalo, sheep, goats, pigs, turkeys, chickens and ducks that make up humanity's store of animal genetic resources, almost a third are in danger of dying out.

Domestic animals, so vital to humans for centuries, are increasingly becoming endangered species as surely as are elephants, tigers, panthers, whales, condors and all the other wild birds and beasts whose existence is under threat.

Scientists say the planet is losing its animal genetic resources at the devastating rate of about one breed a week. This a colossal, perhaps irreplaceable loss, beyond all calculation in mere monetary value.

"There is no doubt about this," says David Steane, a veterinary scientist with the UN Food and Agriculture Organization (FAO). The evidence to back up this frightening conclusion is more than abundant.

Though many people worldwide understand that the giant panda or the white rhino are threatened with extinction, it does not occur to them that the same applies to many farm animals they have seen all their lives.

Biotechnology is rapidly emerging as a very powerful tool in the improvement of different crop plants. Now-a-days advanced research works are being carried out in many countries of the world to improve different plant species including flower crops. Bangladesh should also come forward to adopt the biotechnological techniques for its economic development.

Rhinos, whales and condors often grab the headlines as endangered species. But while buffaloes, pigs and chickens may not be exotic, reports Gemini News Service, they are no less endangered.

Domestic animals account directly for 19 per cent of the world's food basket. If the value of their draught power and natural fertilizer for crop production is added in, the contribution rises to 25 per cent.

In addition, 40 per cent of the land in developing countries is fit only for some form of livestock grazing and an estimated 12 per cent of the world's population — the vast majority in the South — live in areas where people depend entirely on cattle, sheep or goats for their livelihood.

"The problem is simply not understood," says Steane. "And yet, contrary to popular opinion, the importance of domestic animals is not slipping downward, but going up. This is especially true of Asia."

Many Asian farmers, possibly a majority, still depend on draft animals, particularly bullocks and buffaloes, to work their farms.

Asia's hunger for meat, milk and other animal products is also soaring as populations rise throughout the continent, already home to 56 per cent of

the human race and 70 per cent of the world's farmers.

"The demand for milk, and cheese is outrunning greatly stepped-up production in every single Asian nation," says Steane, who heads a new Asia-wide FAO animal conservation project. "There is no reason to believe the demand will abate soon, if indeed ever."

FAO hopes its Japanese-funded project will eventually become worldwide. So far it operates in Bhutan, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, The Philippines, Thailand and Vietnam.

Animal genetic diversity is greatest in the developing world. Asia, for instance, is home to more than 140 breeds of pig, while North America can claim a mere 19. All these and other breeds must be saved for animal breeders worldwide. Their importance is no longer national or regional. In every case it is now global.

"Asia not so long ago had at least double the number of breeds it has today," Steane says. "And every year we lose

several dozen more. Most people don't realise what a menace this is to our planet."

Wars and natural disasters such as flood and drought have played a part in reducing natural animal genetic resources. But sheer neglect and ignorance of the value of domestic animals has wrought the greatest havoc, Steane says. He notes that records suggest that the greatest national livestock losses in recent times occurred in the Soviet Union.

FAO categorises breeds as endangered when there are less than 1,000 breeding females, or 20 or less breeding males. When the total falls to 100 breeding females or five breeding males, that breed's chances of survival are slim.

In Asia, FAO has identified 51 breeds as especially at risk. These include the Min pig — highly prolific, resistant to disease and able to withstand very low temperatures; overcrowded Java's indigenous Zebu cattle — hardy, fertile and resistant to tick infestation; and the Tamarao buffalo of The Philippines — already so rare that extinction may be imminent.

— Gemini News
Peyton Johnson is an American freelance journalist and photographer who was previously press officer for FAO in Bangkok.



To the edge of the precipice: First wild animals, now domestic breeds